

A

Most pleasant Prospect.

INTO THE GARDEN
of Naturall Contemplation
to behold the naturall causes of
all kinde of Meteors.

As well fiery and airie, as watrie and
earthly : of which sort the blazing Starres
shooting Starres, Flames in the Aire, &c.
Thunder, Lightning, Earthquakes, &c. Raine, Dew
Snow, Clouds, Springs, &c. Stones, Metals, and
Earths : To the glory of God, and the
profit of his creatures.

By *W. Fulke* Doctor of Divinity.

*Praise the Lord upon earth, Dragons, and all Deepe
Fire, Hail, Snow, Ice, Windes and Stormes that do
his will. Psal. 148.*

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THE
S
H
E
S
L
F
T
F
I

The Table.

The first booke.

VV Hy Meteors be called, Unperficly mixed. 1

Why they be called, Perficly mixed: 2

The generall cause of all Meteors, and first, of the materiall cause. ibid.

The places in which they are generated. 5

The second booke, of fiery Meteors. 6

The generation of the Impression, called, Burned Stubble, or, Sparkles of fire. 7

Torches. ibid.

Dancing or leaping Goates. ibid.

Shooting and falling Starres. ibid.

Burning candles. 8

Burning beames and round pillars. ibid.

Burning Spears. 9

Shields, Globes, or Bowles. ibid.

Lampes. ibid.

Flying Dragons, or fire Drakes. 10

The Pyramidall pillar, like a Spyre, or broched steeple. 11

Fire scattered in the ayre. ibid.

Lights that goe before men, and follow them

The Table.

them a broad in the field, in the night season.	ibid.
Helena, Castor and Pollux.	13
Flames that appeare upon the hayres of men and beaſts.	14
Comets, or blazing ſtarres.	ibid
Apparitions.	16
Colours wide gapings, and deepe holes, which appeare in the clouds.	17
Wide gaping.	ibid.
Round opening Hiatus.	ibid.
<i>The third booke, of ayry impreſſions.</i>	17
Of windes.	18
Earthquakes.	ibid.
Divers kindes of Earthquakes.	20
How ſo great windes come to be under the earth.	22
The ſignes and tokens that goe before an Earthquake moſt commonly.	ibid
Thunder.	23
Lightning.	28
Fulgetrum.	26
Coruſcation.	ibid
Fulgur.	27
The fourth kind, called Fulmen.	ibid
The firſt kinde.	28
The ſecond kinde.	29
The third kinde.	ibid
	Th

The Table.

2- d.	The mervailles of Lightning, and their causes.	30
13	Storme Windes.	31
of	Whirlewindes.	32
14	The fired whirlewinde.	33
bid	Circles.	34
16	The Raynebow.	35
les,	The milke way, called of some, The way to	
17	Saint <i>Iames</i> and Watling streete.	36
bid.	Beames or streames of light appearing	
bid.	through a cloud.	40
17	Of many Sunnes.	41
18	Many Moones.	42
bid.	Wonderfull apparitions.	44
20		
the	The fourth booke, of watry impressions.	46
22	Of clouds.	ibid.
e an	Mists.	47
ibid	Empty cloudes.	48
23	Raine.	49
29	The signes of raine.	50
26	Monstrous or prodigious raine.	51
ibid	Dew.	53
27	Hoare frost.	54
ibid	Haile.	ibid.
28	Springs and Rivers.	56
29	Fountaines, Brookes, Rivers.	ibid.
ibid	Lakes.	57
Th		Note

The Table.

Hotte bathis.

ibid

The diuers tastes that are perceived in weller

ibid

A recytall of such Rivers and Springs, as have
mervailous effects, whereof no naturall
cause can bee assigned by most men, al-
though some reason in a few may bee
found.

58

Of the Sea.

60

The saltnesse of the Sea.

62

The ebbing and flowing thereof.

ibid

*The fifth booke, of earthly Meteors, or bodies
perfitly mixed.*

62

Of Earths.

ibid

Liquors conerete.

63

Metals.

64

Gold.

ibid

Silver.

65

Copper.

67

Tynne.

ibid

Lead.

ibid

Iron.

68

Quicksilver.

ibid

Stones.

69

The diuers kindes of stones.

ibid

The vertue of stones,

70

72

34H

FINIS.



THE FIRST BOOKE



As much as we intend in this Treatise, to declare the causes of all those bodies, that are generated in the earth, called Fossilia, as well as those other Impressions, named of their height Meteors (which no writer hitherto hath done, that we have seen) the common definition given by the most Writers, in no wise will serve us, and whether we may borrow the name of Meteoron, to comprehend the whole subject of our worke, we are not altogether out of doubt, although the Philosopher describing it from doubtfulness, giveth us some colour so to take it, and peradventure we might be as well excused to apply it to Minerals, as other authors are to use it for earthquakes: yet to avoid all occasions of cavilling at words, we shall both define and also describe the subject of our matter on this manner: it is a body compound without life naturall: & yet to stop one hole, because here wanteth the name of the thing to be defined;

A

defined, it is no new thing to them that haue
 Aristotles. read Aristotles woꝝkes, to find a definition
 of that whereof there is no name. But
 what need you be so pꝛecise (will some man
 say:) mean you so to pꝛocée in all your dis-
 cursive: no verily, but because many of quick
 iudgement, not considering the stile to be
 attempered to the capacitie of the readers,
 will impute the plainenesse to the igno-
 rance of the Authors, we thought good in
 the beginning to pluck the opinion out of
 their minds (that as the common saying is)
 they may know, we haue skill of good man-
 ners, though we little vse them.

The Meteozs are deuised after thꝛee
 maner of wayes: first, into bodieꝝ perfectly
 and imperfectly mixed: Secondly, into
 moist impressions and drie: Thirdly, into fi-
 ery, ayry, watry, and earthly. According to
 this last diuision, we shall speak of them in
 foure bookes following: but first we must
 be occupied alittle in the generall descrip-
 tion of the same, that afterward shall be
 particularly intreated of.

Why they be called vnperfectly mixed.

They are called vnperfectly mixed, be-
 cause they are very soone changed into
 another thing, and resolved into their pro-
 per

per elements of which they doe most consist, as doe all impressions, fyre, ayre, watrie: as snow into water, cloudes into waters &c.

Why they be called perfectly mixed.

The last sort, namely earthlie Meteors, are called perfectly mixed, because they will not easily be changed and resolved from that form which they are in, as be bones, metallis and other mineralls.

According to the qualitie of the matter, they are divided into moist & drie impressions, consisting either of Vapors, or exhalations. Vapors are called moist, and exhalations drie, which termes must be well noted, because they must be much used.

Of the generall cause of all Meteors, and first of the materiall cause.

The matter wherof y most part of Meteors doth consist, is either water or earth: for out of the water, proceed vapors, and out of the earth come exhalations.

Vapor, as y philosopher saith, is a certaine watrie thing; and yet is not water: so exhalation hath a certaine earthly nature in it, but yet it is not earth.

For the better understanding of Vapors understand that they be, as it were

The materiall cause

What be vapors and what exhalations

D. Fulke booke

What the
middle re-
gion is
shall bee
old after-
ward.

fumes or smokes, warme and moist, which
will easily bee resolved into water, much
like to the breath that proceedeth out of a
mans mouth, or out of a pot of water stand-
ing on the fire. These vapours are drawn
up from the waters and watery places by
the heat of the Sun, even unto the middle
region of the ayre, and there after divers
manner of meeting with coldnesse, many
kind of moist Meteors are generated, as
sometimes clouds and raine, sometime
snow and hails; and that such Vapours are
so drawn up by the Sunne, it is plaine by
experience: for if there be a plash of water
on a smooth and hard stone, standing in the
heat of the Sunne, it will sone be drie,
which is none otherwise, but that the
Sunne draweth up the water in thinn
Vapors: for no man is so fond to say, that
it can sticke into stone or mettall, and it is
as great folly to thinke, it is consumed to
nothing: for it is a generall rule, that that
which is once a thing, cannot by changing
become nothing: wherefoze it followeth,
that the water on the stone, as also on the
earth, is for the most part drawn up, when
the stone or earth is dried.

generall
lc.

hat Ex-
halations

Exhalations are as smokes that be hoat
and

and dry, which because they be thinne, and lighter than Vapours, passe the lowest and middle reigion of the ayze, and are carried up eben to the highest region, where for the excessive heat, by neerenesse of the fire, they are kindled, & cause many kind of impressions. They are also sometimes viscole, that is to say, clammy, by reason whereof, they cleaving together and not being dispersed, are after divers sortz set on fire, and appeare sometimes like Dragons, sometime like Goates, sometimes like candles, sometime like speares.

By that which is spoken of Vapours and Exhalations, it is evident, that out of the fire and ayze, no matter whereof Meteors should consist, can be drawn, because of their subtilty and thinnesse. For all Exhalations is, by making a grosser body moze thinne: but the fire (we meane the elementall fire, and not the fire of the kitchen chimney) is so subtile and thinne, that it cannot bee made thinner: likewise the ayze is so thinne, that if it be made thinner, it is changed into fire: and as the fire, if it were made thicker, would become ayze, so the ayze being made grosser, would be turned into water. Wherefore to conclude

D. Fulkes booke

this part, the great quantitie of matter
that causeth these Meteors, is taken out of
the earth and the water. As for the aire and
the fire, they are mixed with this matter
as with all other things, but not so abund-
antly, that they may bee said the materiall
cause of any Meteor, though without them
none can be generated. The efficient cause
of all Meteors is that cause which maketh
them, even as the Carpenter is y^e efficient
cause of an house. This cause is either first
or second.

The effi-
cient
cause.

The first and efficient cause is God the
worker of all wonders, according to that te-
stimonie of the Psalmist, which saith, Fire,
hail, snow, ice, wind and storme, doe his
will and commandement, he sendeth snow
like woolle, &c. Almighty God therefore be-
ing the first, principall and universall cause
efficient of all naturall works and effects,
is also the first cause of these effects, whose
profit is great, and operation marvellous.

The second cause efficient, is double, ei-
ther remote, that is to say, faire off or next
of all. The farther cause of them, as of all o-
ther naturall effects, are the same, the Sun
with the other Planets and Stars, and the
verie heaven it selfe in which they are mo-
ued

fferred. But chiefly the Sunne, by whose heat
nt of all or at least wise, the most part of the va-
e and pors and exhalations are drawne up.

after The next causes efficient as the first
bun- qualities, are heat and cold, which cause di-
triall uers effects in vapors and exhalations.

hem But to returne to the heat of the Sunne,
ause which is a very neere cause, it is for this pur-
keth pose two waies considered.

ient One way, as it is meane and temperate.

first Otherwise, as it is vehement & burning.

the The meane, is by which hee draweth va-
t- pors out of the water, and exhalations out
re, of the earth, and not onely draweth them
his out, but also lifteth them by very high from
ow the earth into the aire, where they are tur-
be- ned into diuers kinds of Meteors.

use The burning heat of the Sunne is, by
ts, which hee burneth, dissipateth and consum-
ole eth the vapors and exhalations befoze he
ns. draweth them up, so that of them no Meteors
ei- can be generated.

rt These two heats proceed from the Sun,
o- either in respect of the place, or the time,
un but most properly according to the casting
he of his beames either directlie or undirect-
o- lie.

In place where the Sunnes beames

D. Fulkes booke

Strike directly against the earth and the water, the heate is so great, that it burneth up the Exhalations and Vapours, so that there are no fiery Meteors, much lesse watery, as it is in the South parts of the world, under and neere to the Equinoctiall line.

But in places where the beames are cast indirectly & obliquely, and that where they are not too nigh to the direct beames, nor too farre off from them, there is a moderate heate, drawing out great abundance of matter, so that in those Countries, many Meteors of many sortes are generated, as in the far North parts are few but watery impressions. Also in Autumne and Spring, are oftener Meteors seene, than in Summer and winter, except it be in such places, where the Summer and Winter are of the temper of Spring and Autumne. Let this be sufficient for the efficient causes of impressions, as well first and principall; as second and particular. Concerning the small and small cause, we have little to say, because the one is so secret, that it is known of no man: the other so evident, that it is plaine, to all men. The essentiall forme of all substances, Gods wisdom

compze.

the comprehendeth, the vniuersall
last end of all things, is the glory
middle ends (if they may be so called) of
these impussions, are manifold profits to
Gods creatures, to make the earth fruitful,
to purge the aire, to set forth his power, to
threaten his vengeance, to punish the
world, to move to repentance, all the which
are referd to one end of Gods eternall glo-
ry, ever to be praised, Amen.

Of the places, in which they
are generat ed,

The places in which Metecrs are cau-
sed, be either the ayre or the earth: in
the ayre be generated raine, hable, snow,
dew, blazing starrs, thunder, lightning, &c.
In the earth be welles, springs, earth-
quakes, metals, minerals, &c. made, and
as it were, in their mothers belly begotten
and fashioned. But for the better under-
standing hereof, such as haue not tasted the
principles of Philosophy, must consider
that there be foure elements, Earth, Wa-
ter, Ayre, and Fire, one compassing ano-
ther round about, sauing that the waters by
Gods comandement are gathered into one
place, that the land might appeare. The
highest is the spheare of the Fire, which
toucheth

toucheth the hollownesse of the moones hea-
 uen: the next is the aire, which is in the
 hollownesse of the fire: the aire within his
 hollownesse, comprehendeth the water and
 the earth, which both make but one spheare
 or Globe, or as the common sort may un-
 derstand it, one ball. So each element is
 within another, as the scales of a pottle are
 one about another: or (to use a grosse simi-
 litude) as the pales of an Onion are one
 within another: after the same sort from
 the highest heauen to the earth, that is low-
 est, one part that is greater compasseth
 round about another that is lesser. But for
 this present purpose it is to be knowne,
 that y^e aire is deuided into three regions, y^e
 highest, the middle and the lowest. The high-
 est because it is next to the region of the fire
 is exceeding hot: the lowest being next the
 earth & waters, is temperate, & by reper-
 cussion or striking backe of the Sun beams
 waxeth hot, and by absence of them is made
 cold, being subiect to winter and summer.
 The middle region of the aire, is alwaies
 exceeding cold, partly because the sun beams
 cannot be cast back so high, and partly be-
 cause the cold that is there, betwene the
 heate above, and the heat beneath it, is so
 kept

that the
 gious of
 aire be.

kept in, that it cannot get out, so that it
 must needs be exceedingly cold: for the wa-
 ter and the earth being both cold Elements
 after the sun setting in the night season, doe
 coole the aire, even to the middle region.
 But in the morning the sunne rising war-
 meth the aire, so farre as his beames which
 are beaten backe from the earth and the
 water, can extend and reach, which is not so
 high as the middle region, and by heat on
 both sides is inclosed and kept, saving that
 a little thereof falleth downe in the night,
 which the next day with much more is dy-
 en backe againe. Wherefore this region
 being so cold, is dark and cloudy, in so much
 that some dotting Divines have imagined
 purgatory to be there in the middle region
 of the aire. In the highest region be gene-
 rated Comets or blazing stars and such like
 of diuers sorts. In the middle region clouds
 remaine, stormes, windes &c. In the lowest re-
 gion, dew, frost, hoze-frost, mists, bright
 fogs, candles burning about graves, and ga-
 tes of swiss, where there is stoe of clamy, fattle
 and oily substance, also lights and flaming
 beere, scene in fields, &c,
 And thus much for the generall causes
 of all Meteors.



THE SECOND BOOKE

of fiery Meteors.



Fiery impzeſſion, is an Exa-
halation ſet on fire, in the
higheſt oz loweſt region of
the ayze, oz eſſe appearing
as though it were ſet on fire
and burning.

They are theſeſoze diuided into flames
and apparitions. Flames are they, which
burne indeede, and are kindled with fire.
Theſe are diſcerned by foure ways: by the
faſhion of them, by their place, by the a-
bundance of their matter, and by the want
of their matter. Their placing is after
the abundance and ſcarcity of the matter
whereof they conſiſt: ſoz if it be great, heavie
by and groſſe, it cannot be carried ſo farre
as the middle region of the ayze, and therefore
ſoze is ſet on fire in the loweſt region: if it
be not ſo great, light, and full of heat, it
paſſeth the middle region, and ascendeth to
the higheſt, where it is eaſily kindled and
ſet on fire.

Accozding to their diuers faſhions, they
haue diuers names: ſoz they are called burn-
ing ſtubble, tozches dauncing oz leaping
Coates

Boates, shooting or falling starres, or candles, burning beams, round pillars, spears, shields, Globes or bowles, firebrands, examples, flying Dragons or fire snakes, the painted pillars or broched steeles, or blinding starres, called Comets. The time when these impressions doe most appeare, is the night season: for if they were caused in the day time, they could not be seen, no more than the starres be seen, because the bright light of the Sunne which is much greater, fireth out the brightnes of them being lesser.

Of the generation of the impression, called burned stubble or sparckles of fire.

The generation of this Meteor is this: Sparks of fire. When the matter of the Exhalation is in all parts alike thin, but not compacted or beaten together, then some part of it being carried up into the highest Region, by the fiery heat is set on fire before another part, if that cometh up after it, & so being kindled, it by little & little, flieth abroad like sparkles out of a chimney, insomuch that the common people suppose, that an infinite number of stars fall down, whereas it is nothing else, but the Exhalation that is thin, but kindled in many parts, sparkling, as when wooddust or cole-dust is cast into the fire.

Of

D. Fulkes booke

Of Torches.

Torches,

Torches or firebrands are thus generated: when the matter of the exhalation is long and not broad, being kindled at one end thereof in the highest region of the aire, it burneth like a torch or firebrand, and continueth till all the matter be burned up, and then goeth out, none otherwise than a Torch, when all the stoffe is spent, much needs burne no longer.

Of dancing or leaping Goates.

Dancing
Goats.

Dancing Goats are caused when the exhalation is divided into two parts, and when two torches be saine together, and the same appeareth to leape or daunce from one part to the other, much like as bals of wildfire daunce up and downe in the water.

Of shooting and falling stars.

shooting
stars.

A Flying, Shooting, or falling star, is when the exhalation being gathered as it were on a round heape, and yet not thoroughly compacted in the highest part of the lowest region of the ayre, being kindled by the force of the cold of the middle region, is beaten backe, and so appeareth as though a star should fall, or slide from place to place. Sometime it is generated after another sort, but there

For there is an exhalation long and narrow
 which being kindled at one end, burneth
 on it swiftly, the fire running from end to end,
 as when a like thread is set on fire at the
 at one end. Some say it is not so much set on
 and fire, as that it is direct under some Starre
 upon the firmament, and so receiving light
 from that Starre, seemeth to our eyes to bee a
 new Starre. Indeed sometimes it may be so, but
 that it is not so alwayes, nor yet most com-
 monly, as it may be easily demonstrated.

The Epicurians, as they are very grosse
 in determining the chiefe goodnesse: so they
 are verie fond in assigning the cause of this
 Meteor. For they say, that the Starres
 will fall out of the firmament, and that by the
 fall of them, both thunder and lightning
 are caused: for the lightning (say they) is
 nothing else but the shining of that Starre
 that falleth, which falling into a watry
 cloude, and being quenched in it, causeth
 that greate thunder, such as hot yron
 maketh a noise if it bee cast into cold wa-
 ter. But it is evident, that the starres of
 the firmament cannot fall, for GOD
 hath set them fast for ever, hee hath gi-
 ven them a Commandement which they
 shall not passe. And though they would
 fall

The Epi-
 curians
 Opinion.

fall into the cloud, yet could they not re-
there, but with their weight being dybe
down, would cōber the whole earth.

the great-
es of
starres.

For the least starre that is seen in the
firmament, is greater than all the earth.
Here will step forth some merry fellows
whych of his conscience thinketh them not
to be aboue thze yards about, and say it is
a loud lie, for he can see within the com-
passe of a busshell, moze than xx. stars. But
if his busshell were on fire xx. myle of, I
demand how bigge it would seeme unto
him: He that hath any wit, will easily per-
ceiue, that starres being by all mens con-
fession, so many thousand miles distant
from the earth, must needs be very great
that so far off should be seen in any quanti-
ty. Thus much for the shooting or falling
starres.

A prooffe
of the
starres
greatnes.

Of burning Candles.

burning
candles.

When the Exhalation carried up into
the highest part of the ayze, is in all
parts thereof of equall and like thinnes,
also long, but not broad, it is set on fire and
blazed like a candle, untill the Exhalation be
quite consumed.

burning
cames

and round
pillers.

Of burning Beames and round pillers.

These are caused, when the Exhalation
being

being long and not very broad, is set on fire all at once, and so burneth like a great beame or logge. The difference of beames and pillars is this : for beames are when they seeme to lie in length in the ayre, but they are called pillars, when they stand right up, the one end neerer to the earth, than the other.

Of burning speares.

Burning speares are generated, when a great quantity of exhalations, which may be called a dry cloud, is set on fire in the midst, and because the cloud is not so compact, that it should suddenly rend, as when thunder is caused, the fire breaketh out at the edges of the cloud, kindling the thine Exhalations, which shoot out in great number like fiery speares, or darts, long & very small, wherefore they continue not long : but when they fade, within a short while after, more fire breaking out, they shoot as many more in their place : and likewise, when they are gone, other succeed, if the quantity of the matter will suffice, more than a dozen courses. This impression was seene in London, Anno Dom. 1560, the thirty day of

Burning
Speares

January, at eight of the clock at night, the ayze in all other places being very darke, but in the North-east where this cloud burned, it was as light as when the day breaketh toward the Sunne rising, in so much, that plaine shadow of things opposite was seene. The edge of this cloud was in fashion like the Raynebow, but in colour very bright, and oftentimes casting forth almost innumerable dartes, of wonderfull length, like squibs that are cast up into the ayze, saving that they moved more swiftly then any squibs.

Of Shields, Globes or bowles.

Shields
lobes or
bowles.

These Mercors also have their name of their fashion, because they are broad, and appeare to be round, otherwise their generation differeth not from the cause of the like impressions before mentioned.

Of Lampes.

Impres.

The Lampe consisteth of an Exhalation that is broad & thick, but not equally extended, namely, smaller at one end than at another, which being kindled about the middle thereof, burneth like a lamp. The cause why, as well this impression, as many other, appeareth round, is not so; that alwaies they are round indeed, but because the

the great distance causeth them to seem so. For even square formes far off seeme to be round. It is witten, that a lamp fell down at Rome, when Germanicus Cæsar set forth the sight of sword players.

Of flying Dragons or fire Drakes.

Flying Dragons, or as Englishmen call them, fire Drakes, be caused on this manner. When a certaine quantity of vapors are gathered together on a heap, being very nere compact, & as it were hard tempered together, this lump of vapors ascending to y region of cold, is forcibly beaten back, which violence of mashing, is sufficient to kindle it, (although some men will have it to be caused between 2. clouds, a hote and a cold, then the highest part, which was climbing upward, being by reason more subtil & thin, appeareth as the Dragons neck, smoking, for that it was lately in the repulse bowed or made crooked, to represent the Dragons belly. The last part by y same repulse turned upward, maketh the tayle, both appearing smaller, for that it is farther off, & also, for that the cold bindeth it. This dragon thus being caused, flieth along in the ayre, & sometime turneth to & fro, if it meet with a cold cloud to beat it back, to y great

Flying
Dragon
or fire
Drakes

D. Fulkes booke

terroure of them that behold it : of whom
some call it a fire Drake : some say it is
the Debill himselfe, and so make report
to other. More than 47. yeres agoe,
on May day, when many young folke
went abroad early in the morning, I re-
member by fire of the clocke in the fore-
none, there was newes come to Lon-
don, that the Debill, the same morning,
was seene flying ower the Thames: af-
terward came word, that he lighted at
Stratford, and there was taken and set
in the stocks, and that though he would
faine have dissembled the matter, by tur-
ning himselfe into the likenesse of a man,
yet was he knowne well enough by his
cloben soote. I knew some then living, that
went to see him, and returning, affirmed,
that hee was indeede seene flying in the
ayre, but was not taken prisoner. I re-
member also, that some wished hee had
been shot at with Gunnes or staffs, as he
flew ower the Thames. Thus doe ig-
norant men iudge of these things that
they know not. As for this Debill, I sup-
pose, it was a flying Dragon, whereas
wee speake, very fearefull to looke upon,
as though hee had life, because he moou-
eth,

both, whereas he is nothing else but cloudes
and smoke: so mighty is God, that he can
scare his enemies with these and such like
operations, whereof some examples may
be found in holy Scripture.

Of the Pyramidall pillar like a spire or
broched Steeple.

This sharp poynted pillar, is generated
in the highest region of the ayre, and
after this sort: When the Exhalation
hath much earthly matter in it, the lighter
parts and thinner (as their nature is)
ascending upward, the grosser, heavier,
and thicker, abide together in the bottome,
and so is it of fashion great beneath, and
small poynted above, and beeing set on fire,
it is so seene, and thereof hath his name.

Of Spire

Of fire scattered in the ayre.

Fire scattered in the ayre, or illumina-
tions, are generated in the lowest re-
gion of the ayre, when very drie and
hote Exhalations are drawne up, and
meeting with cold Cloudes, are sent
back againe, which motions doe set
them a fire; whose parts being not equal-
ly thicke or toynd together, seeme as

Fire scat-
tered.

though fire were scattered in the ayre: yea sometimes, the whole ayre seemeth to burne, as though it would rayne fire from Heauen, & so it hath come to passe, burning both Cities and Townes. Then indge how easy it was for God to raine fire upon Sodom & Gomorra, for their sins & wickednes.

Of lights that goe before men, and follow them abroad in the fields, by the night season.

ght that
eth be-
e men
follow-
n them
the
ght.

There is also a kinde of light that is seen in the night season, and seemeth to goe before men, or to follow them, leading them out of their way unto waters, & other dangerous places. It is also very often scene in the night, of them that saile in the Sea, and sometime will cleave to the mast of the Shippe, or other high parts, sometime glide round about the Shippe, and either rest in one part till it goe out, or else be quenched in the water. This impression scene on the land, is called in Latine, Ignis fatuus, foolish fire, that burneth not, but only feareth soles. That which is scene on the Sea, if it be but one is named Helena, if it be two, it is called Castor and Pollux.

The foolish fire, is an Exhalation
kindled

kindled by meanes of violent moving,
when by cold of the night, in the lowest
region of the ayre, it is beaten downe, and
then commonly, if it be light, seeketh to as-
cend upward, and is sent downe againe;
so it danceth up and downe. Else if it move
not up and downe, it is a great lump of
glewish or oply matter, that by moving
of the heat in it selfe, is enflamed of it
selfe, as moyst hay will be kindled of it
selfe. In hote and fennie Countries,
these lightes are often seene, and where-
as is abundance of such unctuous and
fat matter, as about Church-yards, where
through the corruption of the bodies there
buried, the earth is full of such substance:
wherefore in Church-yards, or places of
common buriall, oftentimes are such lightes
seene, which ignozant and superstitious
foles have thought to be soules tormen-
ted in the fire of Purgatory. Indeede the
devill hath used these lightes (although
they be naturally caused) as strong delu-
sions, to captibe the minds of men, with
feare of the Popes Purgatory, whereby
he did open iniury to the blood of Christ,
which only purgeth us from all our sins,
and delivereth us from all torments, both

tempozall and eternall, according to the saying of the wise-man, The soules of the righteous are in the Hands of God, and no torment toucheth them. But to returne to the lights, in which, there are yet two things to be considered, First, why they lead men out of their way. And secondly, why they seeme to follow men and goe befoze them. The cause why they lead men out of the way, is, that men, while they take heed to such lights, and are alsofoze afraid, they forget their way, and then being once but a little out of their way, they wander they wot not whither, to waters, pittes, and other very dangerous places. Which, when at length they hap the way home, will tell a great tale, how they have beene led about by a spirit in the likenesse of Fire. Now the cause why they seeme to goe befoze men, or to follow them, some men have said to bee the mobing of the ayze, by the going of the man, which ayze mobed, should drive them forward, if they were befoze, and draw them after if they were behind. But this is no reason at all, that the Fire, which is oftentimes thzee or foure miles distant from the man that

that walketh, should be moved to and
 there by that ayre which is moved through
 and is walking, but rather the moving of
 the ayre and the mans eyes, causeth the
 fire to seeme as though it moved: as the
 fire to children seemeth, if they are be-
 fore it, to run after them: if shee be before
 them, to run before them, that they can-
 not overtake her, though she seeme to be
 very neere them. Wherefore these lights
 rather seeme to moove, than that they be
 moved indeed.

Of Helena, Castor, and Pollux.

When the like substance in the Helena,
 lowest region of the ayre, ober Castor,
 the Sea, by the like occasion is set on fire, Pollux.
 if it be one only, it is called Helena, if there
 be two, they are called Castor and Pollux.
 These impressions will oftentimes cleave
 to the mast, and other parts of the Ships,
 by reason of the clamminesse and fatnesse
 of the matter. Helena was of the Heathen
 men, taken as a Goddess, the daughter
 of Jupiter and Leda. Castor and Pollux
 were her brethren. Helena was the occa-
 sion that Troy was destroyed: therefore the
 Spartans by experience trying, that one
 flame

flame of fire appearing alone, signifies
 tempest at hand, supposed the same flame
 to be the goddess Helena, of whom they
 looked for nothing but destruction. But
 when two lights are seene together, they
 are a token of faire weather, and good luck
 the Mariners therefore believed, that they
 were Castor and Pollux, which sayling
 to seeke their sister Helena, being caried
 to Troy by Paris, were never seene af-
 ter and thought to be translated into the
 number of the Gods that give good suc-
 cesse to them that sayle, as we read in
 the last Chapter of the Actes of the Apost-
 les, that the Shippe wherein S. Paul
 sayled, had a badge of Castor and Pollux.
 A naturall cause why they may thus fore-
 tell whether tempest or calme, is this
 One flame alone may give warning of
 a tempest, because that as the matter
 thereof is compact, and not dissolved, so
 it is like, that the matter of tempest
 (which never wanteth) as winde and
 cloudes, is still together, and not dis-
 sipated, then is it like not long after to
 arise. By two flames together may be
 gathered, that as this Exhalation which
 is very thick, is divided: so the thick
 matter

hatter of tempest is dissolved and scatte-
 red abroad, by the same cause that this is
 the bidden. Therefore not without a reason,
 the Mariner to his mates may promise a
 the prosperous course.

Of flames that appeare upon the haire
 of men or beasts.

There is yet another kind of fiery im-
 pression, which is flames of fire upon
 the haire of men & beasts, especially
 the horses. These are sometimes clammy Ex-
 spirations, scattered abroad in the ayre in
 small parts, which in the night, by re-
 sistance, of the cold, are kindled, clea-
 ving on horses eares, on mens heades
 and shoulders that ride or walke. In that
 they cleave upon hayres, it is by the same
 reason, that the dew will be seene also
 upon hayres or garments, whose woll
 is high, as frysle mantels and such
 like. Another sort of these flames, are
 caused, when mens or beasts bodies be-
 ing chafed, send forth a fat & clammy sweat,
 which is in like maner kindled as the sparks
 of fire that are seene when a black horse is
 curried. Livius reporteth of Servius Tulli-
 us, that as he lay a sleep, being a child, his
 hayre seemed to be all in a flame, which

Flames
 upon
 haire
 of men and
 beasts.

Livius
 Servius
 Tullius

Iarius.

for all that, did not burne his haire, or hurt
him. The like hystory he reciteth of another
Marius; a Knight of Rome, that as he made
an Oration to his Souldiers in Spaine
they saw his head burning on a light fire
and himselfe not aware of it. Thus much
concerning these flames.

Of Comets or Blazing Starres.

Comets or
Blazing
Starres.

A Comet is an Exhalation, hote and
drye, of great quantity, fat & clam-
mye, hard compact like a great lump of
pitch, which by the heat of the Sunne,
is drayne out of the earth, into the high-
est region of the ayre, and there, by the ex-
cessive heat of the place, is set on fire, ap-
pearing like a starre with a blazing tayle,
and sometime is mooved after the motion
of the ayre, which is circular, but it ne-
ver goeth downe out of the compasse of
sight, though it be not seene in the day
time for the brightnesse of the Sunne, but
will burneth untill all the matter be con-
sumed. An argument of the greatnesse
is this, that there was never any Comet
yet perceibed, but at the last it endured 7.
dayes: but much longer they have been
seen, namely, forty dayes long, yea,
foure-

hundred score daies . and some, are moneths
 together. Therefore it must needs be
 made wonderfull deals of matter, that can
 laste so much nourishment, for so great
 and fervent fire, and for so long a time.
 There are considered in a Comet, special-
 ly the colour and fashion, which both a-
 rise of the disposition of the matter. Their
 colours be either white, ruddie, or blew.
 And if the matter be thinne, the colour is
 white. If it bee meanely thick, then is
 the Comet ruddie, after the colour of our
 fire : but when the matter is very thick,
 it is blew, like the burning of Winter
 stone. And as the matter is more and
 deeper, after this disposition : so is the Co-
 met, not of colour, more or lesse like to these
 thre principall colours, some yellowish,
 some dusky, some greenish, some wat-
 erish, &c.

In fashion are noted three differences,
 but for either they seeme round, with beames
 round about, or with a beard hanging
 backward, or else with a tayle stretch-
 ed out adelong, in length. The first fa-
 shion is, when the matter is thickest in
 the middle, and thinne round about the
 edges. The second is, when the Exha-
 lation

lation is upward thick, and in length downward also, meanely thick. The third foyme is like the second, saving that the taile hangeth not downe, but lyeth aside, and is commonly longer than the beard. The time of their generation is oftenest in Autumne or harvest.

The tem-
per of the
four
quarters.

For in the spring, there is too much moisture and too little heate, to gather a Comet. In summer, is too much heate, which will disperse and consume the matter that cannot bee toynd together. As for winter, it is cleane contrary to the nature of a Comet, which is hote and drie winter being cold and moist: therefore no time is mete as Autumne.

The signi-
fication of
comets.

Now for so much as many learned men have gone about to declare the significati-
on of blazing starres, we will omit nothing that hath any shadow of reason, but declare what is written of them.

Such things as are set forth of the betokening of Comets, are of two sortes: the first is of naturall, the second of civill or politike effects, They are said to betoken drought, barrennes of the earth & pestilence.

Drought, because a Comet cannot be generated without great heate, and much moisture

moysture is consumed in the burning of it. Barrennes, because the fatnesse of the earth is drawn up, whereof the Comet consisteth. Pestilence, for so much as this kinde of Exhalation corrupteth the ayre, which infecteth the bodies of men and beasts.

The second sort might well be omitted, saving that Aristotle himselfe disdaineth Aristotle not to seeke out causes for some of them. Generally it is noted of all Historiographers, that after the appearing of Comets, most commonly follow great and notable calamities. Beside this, they betoken (say some) warres, seditions, changes of common wealths, and the death of Princes and noble men.

For what times Comets do shine, there be many hote and dry Exhalations in the ayre, which in dry men kinde heat, whereby they are provoked to anger : of anger cometh brawling, of brawling, fighting & warre, of warre, victorie : of victorie, change of common wealths. Then also Princes living more delicately than other men, are more subject to infection, therefore die sooner than other men. If it were lawfull to reason of this sort, we might enduce them to betoken, not only these few things, but all other things that chance in the world.

Yet

D. Fulkes booke

Yet these predictions have a shew of reason, though it be nothing necessary: but it is a word, to see, how the Astrologians do in such devices. They are not ashamed, to ascribe an earthly substance, to ascribe an heavenly influence, and in order of iudgment to use them as very starres. Surely, by as good reason as to the celestially starre, they attribute divine influences and effects. But this their folly hath been sufficiently detected by divers godly and learned men, and this place requireth no long discourse thereof. Wherefore this shall suffice, both for the naturall causes of blazing starres, and also, for all flames in generall. It followeth therefore, that with like brevity we declare the causes of fiery apparitions.

Of Apparitions.

apparitions.

A Fire Apparition, is an Exhalation in the lowest or highest region of the ayre, not verily burning, but by refraction of light either of the Sunne or the Moone, seemeth as though it burned. Which appearance of colour, riseth not of the mixture of the four qualities, as it doth in bodies perfectly mixed, as hearbes, stones

stones, &c. but onely the falling of light upon shadow. The light is in stead of white, & the shadow or darknes in stead of black. These diversly mixed according to the divers disposition of the Exhalation, which ministreth variety by thicknesse or thinnesse, cause divers colours.

There bee commonly recited three kinds of fogg apparitions.

Colours, wide gapings, and deepe holes, which appeare in the clouds.

Of colours.

Colours are here meant, when there is nothing else to be noted, but the colours of the clouds, and they are caused (as it is sayd) by casting the light into the shadowy cloud, according as it excedeth more or lesse in thicknesse, whereof some be very bright white, and that is when the Exhalation is very thin: some yellowish, when the Exhalation is thicker: some ruddy, when it is meanly thick; and very black, when it is very thicke. The red and ruddy colours are seen only in the morning and evening, when the light of the Sunne is not in his full force, for at other times of the day, his light is too vehement, cleare, strong, and pearcing. Thus much of colours.

Colours
the ayre

C

Of

D. Fulkes booke

Of wide gaping.

Wide ga-
ping of
buds in
the ayre.

Wide gaping is caused, when an Ex-
halation is thick in the midst, and thin
on the edges, then the light being receiued
into it, causeth it to appear as though the
sky did rend, and fire bzeake out of it.

Of round opening Hiatus.

Round o-
pening in
the ayre.

These holes called Hiatus, differ from
wide gapings, in nothing, but that they
be lesse, and therefore seeme as though they
were deepe pits or holes, and not rending
or gaping, and these be those apparitions
that appeare fiery, & yet be not so indeed.
Therefore let this be sufficient to haue
shewed the naturall causes of all fiery
Meteors.

The third Booke of Ayry
impressions.



Vnder the name of ayry im-
pressions, be comprehen-
ded such Meteors, whose
matter is most of the aere.
Of this sort be windes,
earthquakes, thunder,
lightnings, stormes, winds, whirlewinds, cir-
cles, rainebowes, the white circle, called
of some, Watling Street, many Sunnes,
many Moones.

Of

Of Windes.

The wind is an Exhalation hot and dry, Winde
drawn up into the ayre by the power of
the Sun, & by reason of the waight thereof
being driven downe, is laterally or side-
longs caried about the earth, and this defini-
tion is to be understood, of generall winds
that blowe over all the earth, or else some
great regions: but besides these, there be par-
ticular winds, which are knowne but only
in some countries, & them not very large:
these winds oftentimes have another ma-
ner of generation, & that is on this manner.
It must needs be confessed, that within the The fa
globe of the earth, be wonderful great holes, cond
caves, or dungeons, in which when ayre a- of wind
boundeth (as it may by diuers causes) this
ayre that cannot abide to be pinned in an-
deth a little hole, in or about those coun-
tries, as it were a mouth to breake out of,
and by this means bloweth vehemently:
yet that force & vehemency extendeth not
farre, but as the wind that cometh forth
of bellows, neere the coming forth is
strong, but far of, is not perceived. So this
particular wind, in that country where it
breaketh forth, is very violent & strong, in
so much, that it overthroweth both trees

and houses, yet in other countries, not very farre distant, no part of that boysterous blast is felt. Wherefoze this wind differeth from the generall winds both in qualities and substance or matter: for the matter of them is an Exhalation, and the qualities such as the nature of the Exhalation is, very ayze, but not ayze indeede: but of this particular wind, the matter and substance is most commonly ayze.

he third
nde of
nde.

There is yet a thirde kinde of winde, which is but a soft gentle and coole moving of the ayze, and commeth from no certaine place (as the generall wind doth) yea, it is felt in the Shaddow under Trees, when in the hote light and shining of the Sunne, it is not perceived. It commeth whisking suddatnely, very pleasant in the heate of the Summer, and ceaseth by and by. This properly is no wind, but a moving of the ayze by some occasion. As for the generall winds, they blow out of divers quarters of the ayze now East, now West, now South, now North, or else enclining to one of the same quarters. Among which the East-wind following the nature of the fire, is hote and drye, the South-wind expressing the qualitie

lity of the ayre, is hote and moyst, the Westerne blasts, agreeing with the waters property, is cold and moyst. The North, that neuer was warmed with the heat of the Sunne, being cold and dry, partaketh the conditions of the Earth. The middle windes haue middle and mixed qualities, after the nature of those foure principall windes moze or lesse, as they encline toward them moze or lesse.

Generally the profit of all windes, by the wonderfull wisdom of the Eternal God, is wonderfull great, unto his creatures. For besides that these windes alter the weather, some of them bring raine, some diness, some frost and snow, which all are necessary, there is yet an vniversall commoditie, that riseth by the only moving of the ayre, which were it not continually stirred, as it is, would sone putrifie, and being putrified, would be a deadly infection to all that hath breath upon the Earth. Wherefore this winde, whose sound we heare, and know not from whence it cometh, nor whither it goeth (for who can affirme from whence it was rayled, or where it

The qualities of winds in the four quarters the world

The quality of middle winds

The profit of wind

John. 3

is laid downe : (as all other creatures beside doe teach us the wonderfull and wise providence of God) that we may worthily cry out with the Psalmist, and say: **L**ord, how manifold are thy works, in wisdome hast thou made them all, &c. Let this be sufficient to have shewed the generation of the winds.

Of Earthquakes.

th-
kes.

An earthquake, is a shaking of the earth which is caused by meanes of winde & Exhalations, that be enclosed within the caves of the earth, and can find no passage to breake forth, or else so narrow a way that it cannot soone enough bee delivered. Wherefore, with great force and violence it breaketh out : and one while shaketh the earth, another while rendeth and cleaveth the same : sometime it casteth up the earth, a great height into the ayre, and sometime it causeth the same to sinke a great depth downe, swallowing both Cities and Townes, yea and also mighty great Mountaines, leaving in the place where they stood, nothing but great holes of an unknowne depth, or else great lakes of waters.

Of divers kinds of Earthquakes.

Divers Authoꝝ write diuersly, of the kinds of earthquakes, some making moze and some lesse, but we shall be content at this time to comprehend them in foure sortz.

Divers
kindes
Earth
quake

The first kinde is when the earth is shaken laterally, to one side, which is, when the whole force of the winde, directeth to one place, and there is no other contrary motion to let it. This winde, if it be not great, shaketh the earth, that it trembleth as a man that hath a fit of an ague, and doth no moze harme: but if it be great and violent, it looseth the foundations of all buildings, be they neuer so strong, and overthroweth whole Cities, but especially the great buildings, and not only such buildings, but sometimes also casteth downe great Hilles, that cower and overthrowe all the valley under them. Many noble and great Cities have been overthrowne by this kind of earthquake. It is written, that twelue of the most beautifull Cities, and most sumptuous buildings in all Asia, where overthrowne and utterly

Twelve
Cities
verth
with
earth-
quake

destroyed with an earthquake. How often Antiochia, yea, within short time was destroyed, they which have read the Histories, can testifie. How terrible was the earthquake that shooke Constantino-
 ple a whole yeere together, that the Emperour, and all the people, were faine to dwell abroad in the fields, under tents and pabillions, for feare their houses would fall on their heads, it is recorded in Chronicles, and worthy to be remembred.

The second kinde is, when the earth with great violence is lifted up, so that the buildings are like to fall, and by and by sinketh downe againe: this is, when all the force of the windes striveth to get upward, after the nature of Gunpowder, and finding some way to be delivered out of bondage, the earth that was hoysed up, returneth to his old place.

The third kinde is a gaping, rending, or cleaving of the earth, when the earth sinketh downe, and swalloweth up Cities, and Townes, with Castles, and Towers, Hilles and Rockes, Rivers, and Floods, so that they be never seene againe. Yea the Sea in some places hath beere
 drunk

instanti-
 ple the
 efest
 e of
 eece,
 y the
 kes;
 ace.

e se-
 d kind:

third

h-
 ce on
 sea.

of-
sunk up, so that men might have gone
ber on foote, untill the time of tyde or
d returning covered the place with
waters againe. But in the land, where
this earthquake swalloweth up any Ci-
ty, or Country, there appeareth nothing
in the place thereof, but a marvellous
wide and deepe gulfe, or hole, Aristotle
maketh mention of diuers places, and re-
gions that were overthrowne with this
kinde of earthquake.

The fourth kinde, is when great
mountaines are cast up out of the earth,
or els when some part of the land sinketh
betwene, and in stead thereof arise Rivers,
Lakes, or Fires breaking out with smoake
and Ashes. It causeth also overflowings
of the Sea, when the Sea bottome is lif-
ed up, and by this meanes arise many I-
lands in the Sea, that neuer were seene
before. These and other such miracles, are
often to be found in the writers of Histo-
ries, also in the Philosophers, as Aristotle,
Seneca, and Plinius.

The fourth
kind.

New
Ilands in
the Sea.

Arist:
Seneca.

Hebertheleffe, the effects of some as Plinius.
most notable, it shall not be unprofitable to recite. Plato in his Dialogue, intitled Timeus, maketh mention by the way of

A wonder-
full earth-
quake.

Africa,
Europa,
Asia, the
three parts
of the earth
Mare medi-
terraneū,
because it
goeth thro-
w the
midst of
the earth.
Atlantis an
Iland.

Seneca.

Theron &
Thersea.

Arist. He-
rodotus.

Egypt
sometime
a gulph of
the Sea.

of a wonderfull earthquake, whereby not
only Africa was rent asunder from Eu-
rope and Asia (as it is indeed at this day
except a little neck by the red Sea) the
Sea entring betwene them that now
called Mare mediterraneum : but also
wonderfull great Iland, which he affirmed
meth, was greater then Africa and Asia
both, called Atlantis, was swallowed up
and covered by the waters, in so much
that on the Sea called Atlanticum, for
great while after, no Shippe could sail
by reason that the same huge Sea, by
solution of the earth of that mighty I-
land, was all turned into mudde. That
famous Ile of Sicilia was also sometime
a part of Italy, and by earthquake rent
sunder from it. Seneca maketh mention
of two Ilands, Theron and Thersea, the
in his time first appeared. It should seem
both by Aristotle, and also by Herodotus
that Egypt, in ancient time, was
goulph of the Sea, and by earthquake
made a drie land. During the reigne
Tiberius the Emperour, twelve notable
Cities of Asia were overthowne in one
night, &c.

How

How so great winds come to be
under the Earth.

The great Caves and Dennes of the Earth, must needs be full of ayre continually : but when by the heate of the sunne, the moisture of the Earth is resolved, many Exhalations are generate as well within the Earth, as without, and whereas the places were full befoze, so that they could receive no more, except for part of that which was in them, no let plant, in such countries, where the Earth hath few pores, or else where they be stopped with moisture, it must needs follow, that these Exhalations striving to get out, must needs rend the Earth in some place, to lift it up, so that either they may have free passage, or else room enough to abide in.

Of the signes and tokens that goe before an earthquake most commonly.

The first is the raging of the Sea, when there are no tempestuous winds to stirre it, yea, when the ayre is most calme without winds. The cause why the Sea then rageth, is, that the wind beginneth to labour for passage, that

The signes of an earthquake.

D.Fulkes booke

that way, and finding none is sent back, and
some after waketh the land.

The second signe is calmenesse of the
ayze, and cold, which commeth to passe
by reason that the Exhalation, that should
be abroad, is within the earth.

The third signe, is said to be a long
thinne strake of cloud sene, when the
skie is cleare, after the setting of the Sunne.
This (say they) is caused, by reason that
the Exhalation or vapor, which is the
matter of cloudes, is gone into the earth.
Other affirme, that it is the Exhalation
that breaketh out of some narrow hole
of the earth, out of which the rest of the wind
cannot issue, neither will it waite the
time: whersoevr within a while after,
it seeketh and maketh it selfe, by sudden e-
ruption, a broader way to be deliuered out
of prison.

Also the Sunne, certaine daies before
it appeareth dimme, because the windes
that should have purged and dissolved the
grosse ayze, that causeth this dimnesse to
our eyes, is enclosed within the bowels
of the earth.

The water in the bottome of deepe
welles is troubled, and the saour thereof
infect.

infected, because the pestilent Exhalations
 have been long inclosed within the earth,
 doe then beginne a little to be sent abroad.
 For thereof commeth it, that in many pla-
 ces where earthquakes have beene, great
 abundance of smoke, flame, and ashes,
 is cast out, when the abundance of bym-
 stone that is under the ground, through
 violent motion is set on fire, and breaketh
 forth. Finally, who knoweth not, what
 stinking minerals and other poysonous
 stiffe doe grow under the earth? where-
 fore it is no wonder, if well-water, befoze
 an earthquake, be infected: but rather it is
 to be marvelled, if after an earthquake,
 there follow not a grievous pestilence,
 when the whole masse of infection is blown
 abroad.

Last of all, there is heard befoze it,
 in the time of it, and after it, a great noise
 and sound under the earth, a terrible
 roaring, and a very thundering, yea,
 sometimes when there followeth no
 earthquake at all, when as the winde,
 without shaking of the earth, findeth a
 way to passe out at. And these for the
 most part, or at least some of them, are
 warnings, that the most fearefull
 earth.

Thunder-
 ing unde
 the earth.

D. Fulkes booke

Cato.

earthquake will follow, than the which
there is no naturall thing, that bringe
men into a greater feare. Cato was ver
curious to confesse himfelfe, that he repe
ted, that euer he went by water, when
he might haue gone by land. But wh
land can be fure, if it be the Lords will,
this worke of his to shake it & what bui
ding fo strong, that can defend us, whe
the more strong, the more danger, the hig
er, the greater fall.

Of Thunder.

Thunder.

Thunder is a foud caused in
clouds by the breaking out of a hote
die Exhalation, beating againft the
edges of the cloud. It is often heard in fpring
& fummer by reason that the heat of the f
then draweth up many Exhalations, wh
meeting in the middle region of the ay
with cold & moift vapors, are together w
them, inclofed in an hollow cloud: b
when the hot Exhalation cannot agree w
the coloneffe of the place, by this ftrife b
ing drawen together made stronger an
kindled, it will neuer breake out, wh
fudden & violent eraption caufeth the noy
which we cal thunder. A fimilitude is put
great authoꝝ, of moift wood that cracke

A fimli
tude.

In the fire: we may adde hereunto the breake-
ing of an egge in the fire, of an apple, or
any like thing: for whatsoeuer holdeth and
withholdeth enclosed any hote wind, so that
it can haue no vent, it will seeke it selfe a
way, by breaking the skin, shell or case. It
were no ill comparison, to liken thunder to
the sound of a gunne, which be both caused
of the same or very like causes.

The sound of thunder is diuers, after
which, men haue deuided the thunder into
diuers kinds, making first 2. sorts, that is,
small thunder & great. But as for the diuer-
sity of sounds, generally it comes of the di-
uers disposition of the cloude, one while ha-
ving moze holes than at another, sometime
thicker in one place, than in another. The
small or little thunder, is when the Exhala-
tion is giuen from side to side of that cloude,
making a noyse, & either for the small quan-
tity, & lesse forceblenes, or else for the thick-
nes of the clouds wals, is not able to breake
them, but rumbleth up & downe within the
cloude, whose sides be stronger than the force
of the Exhalation is able to breake, it run-
neth up & downe within, & striking against
the cloude & moist sides, maketh a noyse, not
unlike to the quenching of hote iron in cold
water.

Divers
kinds of
Thunder.

Small
Thunder,
and the
kinds
thereof.

And

D. Fulkes booke

And if the Exhalation be meanly strong, and the cloud not in all places of like thicknesse it breaketh out at those thin places with such a buzzing, as wind maketh blowing out of narrow holes.

But if the cloud be so thinne, that it cannot keepe in the Exhalation, although it be not kindled, then it bloweth out with like puffing, as wind cometh out of payze of bellows.

Great
thunder
and the
kinds
hereof

A great thunder, is when the Exhalation is much in quantity, and very hote and drie in quality, the cloud also very thick and strong, that easily will not give place to the wind, to escape out.

Wherefoze if the Exhalation doe vehemently shake the cloud, though it doe not at the first disperse it, it maketh a long and fearefull rumbling against the side of the cloud, untill at the last being made stronger by swifter motion, it dissolveth the cloud, and hath liberty to passe out into the open ayze. The cloud dissolved droppeth downe, and then followeth a shoure of raine.

Otherwhyles it shaketh the cloud not long, but straightway rendeth it long

long space and time, whose sound is like the rending of a broad cloth, which noyse continueth a pretty while.

And sometime it discussteth the cloud at once, making a vehement and terrible crack like a gunne, sometime with great force casting out stones: but most commonly fire, which setteth many high places on fire. As in the yere of our Lord, 1561. the fourth day of June, the Steple of Saint Pauls church in London was set on fire, as it hath beene once or twice before, and burned.

The noyse of thunder, though it be great in such places over which it is made, yet is it not hard farre off, especially against the winde. Whereof we had experiente, also in the yere of our Lord, 1561. on Saint Matthias day in February, at the evening, when there was a great flash of lightning, and a very terrible crack of thunder following. they that were but xv. miles from London Westward, heard no noyse, nor sound thereof: the winde that time was Westerne.

How far
thunder
heard.

The effect of thunder is profitable to men; both for that the sweete boynze both follow it, and also for that it pur-

The pro
of thunde

geth and purifieth the ayre, by the swift
moving of the Exhalation that breaketh
forth, as also by the sound, which divid-
ing and pearcing the ayre, causeth it to
be much thinner : which may be verified
by an Historie that Plutarchus in the life
of T. Quincius Flaminius reporteth, that
there was such a noyse made by the Gre-
cians, after their liberty was restozed, that
the Birds of the ayre that flew over them
were seen to fall down, by reason that the
ayre divided by their cry, was made so
thinne, that there was no firmity or
strength in it to beare them up. And let this
suffice for Thunder, whom lightning suc-
ceedeth in treaty, that seldome is from it in
nature.

Of Lightning.

lightning.

Among the divers kinds of lightning,
which writers in this knowledge de-
number, we shall entreat only of foure
kinds, yet so, that under these foure, all the
rest may be comprehended. The names we
must borrow of the Latine tongue. The
first is Fulgurum, The second Coruscario,
the third Fulgur, the fourth Fulmen.

fulgeru.
corusca-
o. Fulgur
fulmen.

Of

Of Fulgetrum.

FULgetrum we call that kinde of light-
ning, which is seene on summer nights
and eveninges, after a hote day. The
generation hereof is such, when many
thinne, light and hote Exhalations, by the
immoderate heate, have bene drawne
up from the earth, and by the absence of
the sunne be destitute of the force, where-
by they should have ben drawne further
upward, yet something ascending by their
owne nature, in that they bee light
and hote, they meete with the cold ei-
ther of the night, in the lowest region, or
else of the ayre, in the middle region, and
so by resistance of contraries (as it hath
bene oft befoze rehearsed) they are beaten
back, and with the vehement moving set
on fire. This lightning commonly goeth
out in the ayre, terrible to behold, not hurt-
full to any thing: Except sometime, when
the matter of it is earthy and grosse being
stricken downe to the earth, it blasseth
corne, and grasse, with other small hurt.
Sometime it setteth a barne or thacked
house on fire. The colour of this
lightning, as of all other, is divers,
partly

Fulgetrum.

The colour of this lightning

partly according to the matter, and partly according to the light. If the matter be thinne, it is white, if the substance be grosse, it is ruddy, like flames of fire : in great light, as in the day, it appeareth white, in the night, ruddy: yet sometime in the day time, we may see it yellow, which is a token that the matter is wonderfull thick & grosse. Old wives are wont to say, that no night in the yere, except one, passeth without lightning: but that is true, as the rest of their tales, whereof they have great store.

Of Coruscation.

rusca-
n.

Coruscation is a glistering of fire, rather than fire indeed, and a glimmering of lightning, rather than lightning it selfe: which is two manner of wayes; one way, when clouds that be lower than the upper part of the earth, without the compasse of our sight, are enflamed; and the reflexion of that flame is cast up into our sight, appearing in all points like lightning, saying that the ayre, where it appeareth, is so cleare, that we are perswaded, no lightning can be there caused. Another way, is when there be thick cloudes over us, and commonly a double order of cloudes, one above

aboue an other : if lightning oz any other inflammation be in the upper part of these clouds, the light of them pierceth thozow the lower parts, as thozow a glasse, and so appeareth, as though it lightned, when perhaps it did lighten indeed : yet that which wee saw, was but the shadow thereof. And this is often without thunder.

Of Fulgur.

Fulgur is that kinde of lightning which followeth thunder, whereof we have spoken befoze. For when that violent Exhalation breaketh forth, making a noyse as it beateth against the sides of the cloud, with the same violence it is set on fire, and casteth a great light, which is seene, farre & nere. And although the lightning appeare unto us, a good pretty while befoze the thunderclap be heard, yet it is not caused befoze the noyse, if any thunder at all doe follow, but either is after it oz with it. Wherefoze that we see it, befoze we heare the thunder, may be ascribed, either to the quicknes of our sight, that preventeth the hearing, oz else to the swift moving of

Fulgur.

The lightning is not before the thunder though seeme so

D. Fulkes booke

ght pre-
ateth
aring.
the fire and the light thereof, to our eyes,
and the slow moving of the sound, unto
our eares and hearing. These three kinds
of lightnings are more fearefull than
hurtfull, but the fourth seldome passeth
without some damage doing.

Of the fourth kinde, called
Fulmen.

The most dangerous, violent and hurt-
full kind of lightning is called Fulmen,
whose generation is such as followeth:
What time a hote Exhalation is enclosed
in a cloud and breaking the same, bursteth
forth, it is set on fire, and with wonderfull
great force stricken downe toward the
earth. The crack of thunder that is made
when this lightning breaketh out, is sud-
den, short, and great, like the sound of a
Gunne. And oftentimes a great Stone is
blowne out with it, which they call the
thunder-bolt, which is made on this ma-
ner. In the Exhalation which is gather-
ed out of the earth, is much earthy mat-
ter, which cloynting together by moisture,
being clammy by nature, consisting of
brimstone, and other metallike substance
by

e thun-
Bolt
out of
clouds.

by the excessive heate, is hardened as a
brick is in the fire, and with the mighty
force of the Exhalation strongly cast to-
ward the earth, and striketh downe tee-
ples, and high buildings of stone, and of
wood, passeth thorow them, and setteth
them on fire, it cleaveth trees and setteth
them on fire: and the stronger the thing is
that resisteth it, the more harme it doth to
it. It is sharpe pointed at one end, and
thick at the other end, which is caused by
reason that the moyfter part, as heavier,
goeth to the bottome of it, so is the top
small, and the bottome thick.

Stronger
things are
most hurt
of light-
ning.

Open write, that the thunderbolt goeth
never above five fote deepe, when it fal-
leth upon the earth: which standeth with
reason, both because the strength of it is
weakened, before it come so neere the
ground, and also, because the continuall
thicknesse of the earth breaketh the force,
were it never so great.

How de
a thund
Bolt go
into the
earth.

Both Aristotle, Seneca, and Plinius
divide this lightning into thre kinds.

Aristot.
Seneca.
Plinius

Of the first.

The first is drye, which burneth not,
to be felt, but divideth, and appeareth

Dry lig-
ning.

D. Fulkes booke

with wonderfull swiftnesse. For being
subtill and pure, it passeth thorow the
pores of any thing, be they never so small,
and such things, as give place unto it, it
hurteth not, but such things as resist, it
dissolveth and pierceth. For it will melt mo-
ney in mens purses, the purses being
whole and unharmed. Yea, it will melt a
sword in the scabbard, and not hurt the
scabbard at all. A wine vessell it will cleave,
and yet the wine shall be so dull, that by
the space of thre dayes, it will not runne
out. It will hurt a mans hand, and not his
globe. It will burne a mans bones within
him to ashes, and yet his skynne and flesh
shall appeare faire, as though nothing had
come to him. Yea, otherwise the whole
man in the moment of an houre shall be
burned to ashes, whereas his clothes shall
not seeme to have been touched. It will al-
so kill the child in the mothers belly, and
not hurt the mother: And all because the
matter is very subtill, and thinne, burning,
and passing thorow whatsoever it be, that
will not give it free passage.

Of the second kinde.

moyst
burning.

The second kinde is moyst, and be-
cause it is very thinne, it burneth not
to

to ashes, but onely blasteth or scorcbeth trees, cozne and grasse: and by reason of the moyst aelle, it maketh all things black that it commeth nere, as moyst wood burning, is smoaky, and maketh things nere it to be black and smoaky.

Why it
maketh
black,

Of the third kinde.

The third kinde is most like our common fire that wee have here on the earth of grosse and earthly substance, wherefoze it leaveth a print where it hath ben, or else consumeth it into ashes, if it be such a body as will be burned with fire.

Grosse
lightning

Of the maruailes of lightning,
and their causes.

Beside the wonderfull effects of lightning, that have been already remembred, there be many other which hereafter ensue, with the reason and causes unto them belonging, as thus:

The mar-
vell of
lightning

The nature of lightning is, to poyson beasts, that are stricken therewith, as though they had been bitten by a Serpent. The cause of this is, that the matter of lightning is much infected with

Lightning
poysoned

Wim.

Witstone, and other popsonous mettall-like substances, which will popson the rather in lightning, because it is thinne, and giveth them passage into every part of the body.

Seneca.

Wine not

running,

the vessels

being bro-

ken.

It is notable, that Seneca writteth, how wine vessels of wood being burned with lightning, the wine would stand still, and not runne out: the reason hereof, is the swift alteration and change, whereby also all the clamminesse of the wine is drawne to the outwardmost part, and so keepeth in the wine, as in a skinne, that by the space of thzee dayes it will not run. It will also popson wine, insomuch that they which drinke thereof, shall either be madde, or dye of it: the cause hereof was set forth befoze.

Lightning

purgeth a

popsonous

beast.

Snake

cederth

Wormes

Lightning that striketh a popsonous beast, purgeth it from the popson, in so much, that it causeth a Serpent or snake which it killeth, to breede wormes, which otherwise it would not doe, but being purged from the naturall popson, by the swift pearcing of the lightning, nothing letteth, but that it may breede wormes, as all other corrupt flesh will doe.

If lightning strike one that slepeth, it openeth his eyes, and of one that waketh, it shutteth the eyes. The cause is this, that it waketh him that slepeth, and killeth him, before he can close his eyes againe. And him that waketh, it so amazeth, that he winketh, as he will doe at any sudden chance: so hee dyeth, before he can open his eyes againe.

All living things turne their face toward the stroke of the lightning, because it is their nature, to turne their head if any thing come suddenly behind them. The rest that have their face toward it, when it commeth, never turne before they be killed.

The reason why it killeth the child in the mothers wombe, not hurting the mother, is the tendernes of the one, and the strength of the other, when the lightning is not vehement, otherwise both should die together.

Sometime lightning burneth only the garments, shewes, or hayze of men, not hurting their bodies, and then the Exhalation is nothing vehement. Sometime it killeth a man, & there appeareth no wound

wound without, neither any hurt within
no not so much as any signe of burning
for then the Exhalation, which being kin-
dled, is called lightning, is wonderfull
subtill and thinne, so swiftly passing
thorow, that it leaveth no marke or token
behind it.

lightning
maketh
blindness,
swelling
of Lepro-
c.

They that behold the lightning, are
either made blinde, or their face swelleth,
or else become Lepers, for that fiery Ex-
halation, receyved into the pores of their
face and eyes, maketh their face to swell
and bzeake out into a Leprosie, and also
dzyeth up the Chyrtalline humour of their
eyes, so that consequently they must needs
be blind.

Eutropius.
Marcus
Tullius
Cicero.
Apulia:

Eutropius sheweth, that the same day,
in which Marcus Tullius Cicero was
borne, a certaine Virgine of Rome riding
into Apulia, was stricken with light-
ning, so that all her garments being ta-
ken from her without any rending, she
lay starke naked, the lasing of her best
being undone, and her hose garters unty-
ed, yea, her bzacelets, collars, and rings
being all lused from her. Likewise her
horse lay dead, with his bzidle and girtes
untied.

The places of them that are burnt with lightning, are colder than the rest of their bodies, either because the greater heat dyes away the lesser, or else, because that by the great violence, the vitall heat is quite extinguished in that place.

The wounds of lightning cold.

The Sea-Calf is never hurt with lightning: wherefore the Emperours tents were wont to be covered with their skins.

Sea Calfe not hurt with lightning.

The Bay Trees, and Box Trees, are never, or seldome striken with lightning. The cause of these may be, the hardnesse of their skinne, which hath so few pores, that the Exhalation cannot enter into them.

Bayes and Box Trees seldome hurt with lightning.

The Eagle also among fowles, is not striken with lightning. Wherefore the Poets sayne, that the Eagle carrieth Jupiters armour, which is lightning. The reason may be the thicknesse and dymnesse of her feathers, which will not be kindled with so swift a fire.

The Eagle Jupiters harnesse-bearer.

Of storme Windes.

A storme wind, is a thick Exhalation, violently moved out of a cloud, without inflammation or burning: the matter

Storme windes.

D. Fulkes booke

ter of this soyme is all one with the matter of lightning, that hath bene spoken of namely, it is an Exhalation very hote and drye, and also grosse and thick, so that it will easily be set on fire: but then, it hath another name, and other effects.

The soyme or maner of the generation is such: When aboundance of that kind of Exhalation is gathered together, within a cloud, which needs will have one way out or other, it breaketh the cloud, and causeth thunder, as it hath bene taught before: but if the matter be very thick, and the cloud somewhat thinne, then doth it not rend the cloud, but falling downe, beareth the cloud before it, and so is carried, as an arrow out of a bow. It doth alwayes goe before a great sudden shewe; for when the cloud is broken the water must needs fall downe. Also it is so grosse, and so thick, that it darkneth the ayre, and maketh all the lowest region of the ayre, to be in manner, as a darke smoaky cloud. It causeth tempest in the Sea, and wonderfull great danger to them that beare sayle, whom if it overtake, it bringeth to utter destruction.

So sudden is this kind, that it cannot be resisted

resisted with sudden helpe.

So violent it is, that feeble force cannot withstand it.

Finally, it is so troublesome with thunder, lightning, rayne, and blast, besides these, darknesse and cold, that it would make men, at so neere a pinch, to be at their wits end, if they were not accustomed to such tumultuous tempest.

Wherefore it were profitable, to declare the signes that goe befoze it, to the end men might beware of it.

But they are so common to other tempests, that either they are knowne well enough, or else being neuer so well known, in a seldome calamity, they would little be feared.

The Sea Ships subiect to moze danger, have moze helpe, if it bee used in time: but no signes foreknowne, can profit the dweller of the land, to keepe his house from ruine, except it were to save his life from the fall of his mansion.

The sudden violence of this tempest to him, is moze seldome times, but moze incurable, when it commeth, than to the Marryner, who hath some ayde to

to look for, by his comming : the other, if he
escape with his life, may comfort himselfe
that he was nere a great danger, and call
with himselfe to build up his house againe.

Of whirlwinds.

Whirle-
winds.

A Whirlewind, is a wind breaking
out of a cloud, rowling or winding
round about, overthrowing that which
standeth neere it, and that which com-
meth before it, carryng it with him aloft
in the ayre.

It differeth from a Storme wind in these
points.

First in the matter which is lesse in
quantity, and of thinner substance.

Secondly, in the moving, which is cir-
cular, winding about, whereas the
Storme bloweth aslope and adelong. Al-
so a whirlewinde, in the moving divideth
not it selfe abroad, and bloweth directly
as the Storme doth.

And thirdly, in the manner of the gene-
ration : for a Storme doth alwayes come
out of one cloud, but a whirlewind some-
time is caused by meanes of two contrary
windes that meete together.

In like manner, as we see in the streets
of

of Cities, where the wind is beaten back from two walles, meeting in the middell of the street, there is made a little whirlewind, which whirling round about, taketh up the dust, or strawes, and bloweth it about, after the very similitude of the great and fearefull whirlewind.

The reason of the going about, is this, that when the walles beat back the wind from them, which aboundeth in that place, and those windes, when they meete, by reason of equall force on both sides, can neither drive one the other back againe, nor yet passe thorow one the other, it must needs be, that they must both seeke a way on the side at once, and consequently, be carried round about, the one, as if were, pursuing the other, untill there be space enough in the ayre, that they may be parted asunder.

The matter of a whirlewind, is not much differing from the matter of thorne and lightning, that is, an Exhalation hotte and drie, breaking out of a cloud, in divers partes of it, which causeth the blowing about. Also it is caused, as it hath beene sayd, by two, or more windes, blowing from divers places,

C

which

The trou-
bles of
whirle-
winds.

which may be of particular causes, they
have bene shewed before in the Chapter of
winder. This tempest is noysome to man
and beast, Sea and Land, things living, and
life lacking: For it will take up both men
and beasts, stones & clods of earth: which
when it hath bozne a great way, will not
be so courteous, as to set them downe a-
gaine, but negligently letteth them fall
from a great height, or else violently
thzoweth them downe to the earth.

It breaketh Trees, winding them about
and pulling them up by the rootes. It tur-
neth about a ship, and bruiseth it in peces
with other mischieses besides.

Of fired whirlewinds.

fired
whirl-
winds.

Sometime a whirlewind is set on fire
within the cloud, & then breaking forth
flyeth round like a great cart wheel,
terrible to behold, burning and overthrow-
ing all oze things that it cometh nere, as
houses, woods, corne, grasse, and whatsoe-
ver else standeth in the way.

It differeth not from a whirlewind, sa-
ving that it is kindled and set on fire, so
appearing, else the generation of both is
called

called one.

Of Circles.

The Circle called Halon is a garland of diuers colours that is seen about the Sunne, the Moone, or any other Starre, specially about Jupiter or Venus, for their great brightnesse. It is called of the Greeks a compassed plat, of the Latines, a crowne or garland.

Circles
about the
Sunne,
Moone
and other
Starres
Jupiter
Venus
Planets

The matter wherein it is made, is a cloud of equall thicknes, or thinnesse, coming directly under the body of the Sunne, the Moone, or other Starres, into which, the light of the heavenly body is receiued, and so appeareth round, because the Starre is round: or as a Stone cast into the water, maketh many round circles, dilating in breadth, untill the violence of the mowing is ended; so is it in the ayre, the light beams piercing it, cause broad circles to be dilated, which appeare white, purple, black, red, green, blew, and other colours, according to the disposition of the clouds matter. The cause of such colours, is shewed before, in the peculiar treatise of colours.

Circles
the water

The colours
of
circles.

This circle is oftner scene about the Moone, than about the Sunne, because

the heate of the Sunne dꝛaweth the vapors too high, where it cannot be made. Also, because the night is a more quiet time than the day, from winde, it is more often in the night, than in the day. Seldome, about other Starres, because their light beames, are too weake often to pierce a cloud: yet oftner about small Stars than the Sunne, because the light of the Sunne pierceth the cloud more forcibly, than that this Halon can many times be cause.

Otherwhiles it is sene about a candle, which must be in a very thick and grosse ayre of such proportionate thicknesse, that it may receiue the light as the cloud doth from the Starres, as in the smoaky places, or hote houses.

This kinde of circle is sometimes like a Rainebow, saviing that it is a whole circle, unlesse the Starre under which it is caused, be not all risen, or else the cloud, in which it is sene, be not all come under the Starre, or after it hath come under some part thereof, be dissolved from the rest.

These Circles be signes of tempests and windes, as witnesse both Virgil, & Aratus.

The

rcles
out a
ndle.

he signs
these
rcles.

rgilius,
ratus,
oets.

The winde shall blow from that quarter, where the Circle first beginneth to breake. The cause whereof is this, that the Circle is broken by the winde that is above which is not yet come downe towards us, but by this effect above, wee may gather, both that it will come, and also from what quarter.

A great Circle about the Moone, be- tokeneth great cold and frost to follow after.

Signe
frost.

But if it vanish away and bee dissol- ved altogether, it is a signe of sayre wea- ther.

Signe of
faire wea-
ther.

If it be broken in many partes, it sig- nifieth tempest.

Signe of
tempest.

If it were altogether thicker and dar- ker, it is a forewarning of rayne.

Signe of
rayne.

One alone, after Ptolomee, pure and white, vanishing away by little and little, is a token of faire weather.

Ptolomee
us. Signe
of faire
weather.

Two or thre at once, portendeth tem- pest: if they be ruddy, they shew wind to come; and toward snow, they seeme as it were broken and rocky.

Being darke or dimme, they signifie all these foresaid events, with more

Signe
Snow.

D. Fulkes booke

force and abundance: it is oftener caused in
Autumne and Spring, than in Winter or
Summer: the cause is the temperatenesse
of the time.

*Aristo.
tippo.* The cause why it appeareth sometime
greater, and sometime lesser, is in the qua-
lity of the matter, which as it is grosse or
thinne, will more or lesse bee dilated and
stretched abroad, and also as some wil have
it, of the weakenesse of mens sight. Of
which, Aristotle bringeth an example in
one Antipho, which did alwayes see his
owne image befoze him in the ayre, as in
a glasse: which he affirmeth to have beene
for the weakenesse of his sight beames, that
could not pierce the ayre, so that they were
reflected againe to himselfe.

And thus much for Halos, and the causes,
signes, or tokens of it.

Of the Rainebow.

yncebow

*ffido-
is.*

The Rainebow, is the apparition of
certaine colours in a cloud, opposite a-
gainst the Sunne, in fashion of halfe a Cir-
cle. Possidonius said, it was the Sunnes
looking glasse, wherein his image was re-
presented, and that the blue colour, was
the

the proper colour of the cloud; the red, of the Sunne; all the other colours of commixtion.

It differeth manifoldly from Halon: for the Rayne-bow is alwayes opposite against the Sunne: but Halon is directly under it.

They differ not onely in place, but also in fashion: the Raynebow is but halfe a Circle: the Halon is a whole Circle.

Likewise they vary in colour: for the Rayne-bow is more dimme, and of purple colour: the Halon, whiter and brighter.

Also, in continuance, for the Rayne-bow may continue longer than Halon.

The image of the Rayne-bow may be seen on a wall, the Swaine striking thozow a six-pointed Stone, called Iris, or any other Chzistall of the same fashion; also thozow some glasse window.

A prece
stone
led Iris

Halon is seen about Candles, in smoky places, as are baths and kitchens.

The manner of the generation of the Rayne-bow is such: There is opposite against the Sunne, a thicke watery cloud, which is already resolved into

dewy drops of rayne, as (for a grosse li-
 mili- mitude) is seen on the potliode, when
 the water in the vessell hath sodden, or
 is very hote, the liode will be all full of
 small drops of water, which come from
 the water in the vessell, first, by heats
 resolved into smoake, after, when it can-
 not goe at large, it is resolved againe.
 Therefore upon such a cloud, the Sunne
 beames striking, as upon a smooth glasse,
 doe expresse the image of the Sunne un-
 perfectly, for the great distance. Or else
 the Sunne beames striking into a hollow
 cloud, where they are refracted or broken,
 and so come to the eyes of him that behol-
 deth the Raynbow.

simili- The similitude thereof is scene, when
 of the men sayle or row in boates, the Sunne
 abow- shineth upon the water, which casteth on
 the vessels side, the colours and image of
 the Raynbow.

Likewise, water in an urinall holden
 against the Sunne, receiveth the light, and
 sheweth colours on the wall.

Raynbow There be two kinds of Raynbowes,
 of the Sun, one of the Sunne, another of the Moone;
 abow the one by day, the other by night: the
 Raynbow of the Sunne often, but of the
 Moone

poone very seldome, in so much that it can be but twice in fifty yeeres, and that when the poone is in the East or West, full in perfect opposition.

It hath not bene many times seene since the writing of Histories, yet sometimes, and for the rareness, is taken for a great wonder. Yet is it in colour nothing so beautifull as the Sunnes, but for the most part white as milke: other diversities of colours are scant perceybed. When it appeareth, it is said to signifie tempest.

The time of the Raynbow is often after the poynt of Autumne, both for the placing of the Sun in constant lowness, and also for abundance of matter, seldome or never is the Raynbow seene about the midst of Summer.

There may be many Raynbows at one time, yet commonly but one principall, of which the rest are but shadowes and images, the second, shadow of the first, the third, of the second, as appeares by placing of their colours.

It remaineth, to shew why it is but halfe a circle, or lesse, and never more, and why the whole cloud receiveth not the same

same colours that the Rayne-bow hath. The cause of the first is, because the center or middle poynt of the Raynebow, that is Diametrally opposite to the center of the same, is alwayes either in the Horizon (that is, the circle cutting off our sight of Heauen by the earth) or under it. The cause why the whole cloud is not coloured is, because that in the middell, the beames as strong, pearce theow, but on the edges where they are weaker, they are reflected or refracted.

Now so much as G. D. made the Raynbow a signe and Sacrament of the promise, some thinke it was never seen before the flood: their reason may be this, that the earth, after the first creation, was then so fruitfull, that it needed none, or very little rayne, so that such darke clouds were not often gathered, & fruitfull ground not so easily remitting his moisture, that then was fat and clammy, hard to be dwtwn up: so it might be, that there was no raynebow before, as we cannot find that eber it rayned before. But whether it were or not, it is certaine, that then it became a Sacrament, whereas it was none before: which when we behold, it beholds

as to remember the truth of God in all his promises, to his glory and our comfort.

The milke way, called of some, the way to S. James, and Warling Sreete.

The milke way is a white circle scene in a clere night, as it were in the firmament, passing by the signes of Sagittarius and Gemini.

The white circle seen in the night.

The cause thereof is not agreed upon among Philosophers, whose opinions I thought best to report, before I come to the most probable causes.

First of all, Pythagoras is charged with a poeticall fable, as though it had bene caused, by reason that the Sunne did once runne out of his pathway, and burned this part, whereof it looketh white.

Pythagoras

Other, as Anaxagoras and Democritus, sayd, that it was the light of certaine starres, shining by themselves, of their owne light, which in the absence of the Sun might be scene. But this opinion is also false, for the Starres have no light of themselves, but of the Sun: also if it were so, it should appeare about other Starres.

Anaxagoras.
Democritus.

Democritus

D. Fulkes booke

Democritus is also reported to have sayd
that it was nothing else but innumerable
little Starres, which with their confus
light, caused that whitnesse: to this opinion
ardanus. Cardane seemeth to subscribe.

The Poets have foure fables of it: one
haeton. that Phaeton, which on a time guided the
Chariot of the Sunne, and wandring out
of the way, did burne that place, wherefore
of Jupiter he was stricken downe with
lightning.

The second, that it is the high street in
vid. Heaen that goeth streight to Jupiters pa
lata. pr. lace, and both sides of it the common sort of
gods do dwell.

The third, that Hebe, one which was
Jupiters Cupbearer, on a time stumbled
lebe. a starre, and shed the wine or milke that
was in the cup, which coloured that part
of Heaen to this day: wherefore she was
put out of her office.

The fourth that Apollo stood there
pollo. to fight against the Giants, which Ju
piter made to appeare, for a perpetual
memozy.

Theophrastus, a philosopher, affir
med, that it was the topning together, or
heophra- teame of the 2. halfe Globes, which made it
us. appeare

appeare moze light in that place than in o-
ther.

Other said, it was the reflexion of the
shining light of fire or starre light, as it is
sene in a glasse, but then it should be move-
ble.

Diodorus affirmed, that it was Heavens
fire, condensed or made thick, into a cir-
cle, and so became visible, whereas the
rest, for the purenesse, clearnesse, and thin-
nesse, could not be sene.

Diodorus

Possidonius : whose mind to many se-
meth very reasonable, said, it is the in-
fusion of the heats of Starres, which
wherefoze is in a Circle, contrary to the
Zodiacke, (out of which the Sunne never
wandzeth) because it might temper the
whole compasse with vitall and lively
heat. Although in my mind he hath rather
suppressed the small cause, than the effect-
ment.

Possido-
nius.

Zodiacke.

Aristotles opinion is, that it should be
the beames of a great Circle, which is cau-
sed by a cloud or Exhalation drawn up
by those Starres, which he called Spora-
des. This opinion of Aristotles is misli-
ked of most men that have travayled
in this science, and worthily : For if it
were

Aristotle.

Sporades.

whereof the nature of elements as Exhalations are, it would be at length considered. But this circle never corrupted therefore it is not of Exhalations. Also neither increaseth nor diminisheth, which is a plaine proofe, that it consisteth not of elementall matter, although Aristotle seeme to make a double circle, one celestiall, and the other elementall.

The last opinion is, of them that say it is of the nature of heaven, thicker in substance, than other parts of Heaven be, having some likenesse to the substance of the Moone, which being lightened by the same as all the Starres be, appeareth white. And this opinion I take to be most probable because that sentence of Star-light seemeth not so reasonably, to be only in that place and not elsewhere.

The small cause of this milke-white circle, hath beene already touched in the opinion of Possidonius, whereunto also Plinius in the xviii. Book, and xxix. Chapter of his naturall History, agreeth, affirming that it is very profitable for the generation and fruitfull increase of things that grow on the earth. The Mathematicians therefore have measured the breadth thereof, affirming that

Possidonius.
Plinius.

The
breadth of
this circle.

that toward the North, it passeth over the
 eclipticall line of the ninth sphere, from the
 xliii. degree of Gemini, unto the ii. degree
 of Cancer, which is xlii. degrees and toward
 the South, from the viii. degree of Sagitta-
 rius, to the xlii. degree of the same signe: and
 because it is there divided into ii. branches
 (as may easily be seen in a cleare night)
 it reacheth from the xlii. of Sagittarius, to
 the ii. degree of Capricorne.

This circle, if it be of the nature of Bea-
 den, is improperly placed among Meteors
 or impressions: but because of Aristotles
 mind, who will have it to be an impression
 kindled, & their opinion, which think it pro-
 ceedeth of the light of Starres, it is not with-
 out good cause in this place intreated of.

Of beames, or streames of light, ap-
 pearing thorow a Cloud.

There is yet another kind of impression Beames & streames
 caused by the beames of the Sunne,
 stricken thzough a watery cloud, being of
 unequall thinnesse, and is thinner in one
 part than in another, so that it cannot
 receybe the beames in any other forme,
 than that they appeare direct or slope
 downeward of divers colours, and the
 same that are the colours of the Rayne-
 bow,

D. Fulkes booke

bow, though not so evident, because the reflexion is not so strong. They vary in colours: some are more purple or ruddy, when the cloud is thicker, some yellow or whitish, when the cloud is thinner, and so other colours are caused likewise, whereof you may read the proper cause in the colours of clouds and other like parts of this Treatise.

The common people call it the descending of the holy Ghost, or our Ladies Assumption, because these things are painted after such a sort. Other say that it is raine, striking down in another place, as though they could see the drops falling. And they are not altogether deceived, but in the time: for soon after, it will rayne, because this impression appeareth out of a watery cloud. They are called by divers names, as rods, wands, cords of Lents, unto which they are not much unlike, Raves and little pillars, when they seem greater and thicker, many being joined together.

The Raynbow, the circles, and these light beames, are all of one manner of generation, in so much that if you divide the circle, it shall be a Raynbow, if you draw it streight in length, it maketh streames or beames.

beames. Herein they agree, namely, in forme and matter, but they differ in outward forme, which we may call fashion, as the one is round, the other halfe round, and the third direct, straight or falling aslope. Also, they differ in place, about which they stand: for streames are only about the Sunne. Raynbowes about the Sunne often, and seldom about the Moone, but circles both about the Sunne and the Moone, and also about any other of all the starres, yet rather, & oftner about bright starres.

To make an end of these streames, they appeare diversly, after the fashion & place wherein the cloud hangeth, in respect of the Sunne: for sometime they are seen only in the edge of a cloud, all the breadth of that cloud: sometime thorow the mids of a cloud, being thinner there than in other parts, and then they are spread round about, like a tent or pavilion used in war. They are most commonly seen in such times, as there is great abundance of raine, which they, by their apparition, doe signifie not yet to be ended.

And thus much concerning direct light beames called rodes, &c.

Of many Sunnes.

Many
sunnes
once.
Alexander
the great.
Darius.

It is strange and marvellous to behold the likelihood of that, which Alexander the great, sending word to Darius, said to be impossible, that two Sunnes should rule the World. But oftentimes, men have seen, as they thought in the firmament, not only two Sunnes, but oftner three Sunnes, and many more in number, though not so often appearing. These, how wonderfull soever they appeare, procede of a naturall cause, which we will endeavour to expresse. They are nothing else but Idols or Images of the Sunne, represented in an equall, smooth, and watry cloud placed on the side of the Sunne, and sometimes on both sides, into which the Sunne beams being receiued, as in a glasse expresse the likenesse of fashion and light that is in the Sunne, appearing as though there were many Sunnes, whereas indeed there is but one, and all the rest are images.

This thick and watry cloud, is not said to be under the Sunne, for then it would make the Circles, called crownes or garlands: it is not opposite to the Sunne, for then would it make the Rainbows: but it is

says

sayd to be on the side, where the image may be best represented. Also it may not be too farre off, for then the beames will be too feeble to be reflected: neither yet too neere; for if it so be, the Sun will disperse it: but in a competent & middle distance: for so representation of many Sunnes is caused.

They are most often seene in the morning and evening, about the rising or going down of the Sunne, seldome at noone time, or about the midst of the day, because the heat will soon dissolve them: yet have there bene some seene, which began in the morning, & continued all the day long, unto the evening. Sometimes there appeare many little Suns, like unto little Starres, which are caused after the same sort, as we do see a mans face to be expressed in all the pieces of a broken glasse. So when the cloud hath many separations, there appeare many such ones, on one side of the true Sun, sometimes great, & sometimes little, as the parts of the cloud separated, are in quantity.

Many small Sunnes, like starres

Similitude.

They doe naturally betoken tempest and rayne to follow, because they cannot appeare, but in a watry disposition of the ayre.

The signification of many Sunnes.

D. Fulkes booke

Also, if they appeare on the South-side of the Sunne, they signifie a greater tempest, than if they appeare on the North-side. The reason is alleadged, because the Southerne vapour is sooner resolued into water, than is the Northerne.

For a supernaturall signification, they have oftentimes bene noted, to have pretended the contention of Princes for kingdomes: As not long before the contenti-
on of Galba, Otho, and Vitellius, for the Empire of Rome, there appeared three Sunnes. Also of late, toward the daughter of Lewis King of Hungary, were seen three Sunnes, betokening three Princes that contended for the kingdome, namely Ferdinando since Emperour, Iohn Vayvode, and the great Turke.

Of many Moones.

After the treaty of many Sunnes, it were not hard for any man without farther instruction to know the naturall cause of many Moones: For they are likewise Images of the Moone, represented in an equall cloud, which is watry, smooth, and polished, even like a glasse. Some call them (as Plinius sayth) night Sunnes, because they, ioyned with the light
of

Galba,
Otho, and
Vitellius.

many
Moones.

Plinius.

of the true Moone, giue a great shining light, to drive away the shadow and darkness of the night.

It were superfluous, to write more of their causes, or effects, which are all one with those, that have bene declared of the Sunnes.

It may bee doubted, why the other starres doe not likewise expresse their image, in watry clouds, and so the number of them, to our sight, should be multiplied. It may be answered, that their light or beames are too feeble and weake, to expresse any such similitude or likenesse in the watry clouds: For although they have garlands, or circles about them that are capled in a vapor, that is under them, yet it is manifest, that this apparition hath not need of so strong a light, as is required to print the images of them in the clouds. Again, the garlands are direct under, and therefore apter to receive such apparition.

It may be againe objected, that the starres have their image perfectly and sufficiently expressed in glasses here on the earth, yea, and at the day time, when their light is eyther none, or most feeble, and

Why other
starres are
not so
presente

Objectio

weake, as we see it is used at Midsummer, to behold that great Starre called Sirius, in a glasse eben at noone dayes.

Sirius a
great
starre seen
at noone in
summer.

Also we see every night, the image of the Starres in calme and quiet standing waters: then, what should let, but that their images might also be expressed in watry cloudes?

In answer.

Hereto may be answered, that the let is in the cloud, which is neither so hard as is the glasse, nor yet so continuall as the water, but consisteth of innumerable small drops, so that except the light of the Starres were stronger, it can in them expresse no unifoyme images of them, as it doth in glasses, and in the water. Notwithstanding, in writers of wonders, we read some such like thing sometime to have chanced.

There hath bene often scene many Sunnes in the day time, and after the Sun setting: at the rising of the full Moone, there have appeared many Moones, which was by this meanes, that the same cloud, that receiued the Sunne beames in the morning, tarried in the same place, and at the Moones rising, was ready also to receive her image.

Of

Of wonderfull apparitions.

We will close this booke, with a full app
briefe declaration of the naty. ritions.

rall causes of many things that are seen in
the ayre, very wonderfull and strange to be-
hold, which in these latter yeres have bin
often seen and beheld, to the great admira-
tion of all men, not without the singular
providence of God, to sozwarne us of ma-
ny dangers that hang over us, in these most
perillous times.

The apparitions of which, as it is most
wonderfull, so the searching of the cause,
to us is most hard and difficult, a great
deale the rather, because no man hath hi-
therto enterprised (to my knowledge) to
seek out any cause of them, but all men
have taken them as immediate miracles,
without any naturall means or cause to
procure them.

And I truly doe acknowledge, that
they are sent of God, as wonderfull signes,
to declare his power, & move us to amend-
ment of life, indeed miraculous, but not
yet so, that they want a naturall cause: so
if they be well weighed & considered, it is
not hard to find, that they differ much from
such miracles as are recorded in the Scrip-
ture,

ture, and admitted of diuines. So that I abhorre the opinion of Epicures, to thinke that such things come by chance, but rather by the determined purpose of Gods providence: so I consent not with them, that suppose, when any thing is deriued from any naturall cause, God the cause and best cause of all things is excluded.

Some of these wonderfull apparitions consist of circles and Raynbowes, of diuers fashions and placings, as one within another the edge of one touching another, one descending or going thorow another, with like placing of small circles about great circles or parts of small circles; some with the ends upward, some downward, some aside, and some a crosse, but all for the most part in unifoyme order constituted or placed for the order of them, pleasant to behold, but for the strangenesse, somewhat fearefull. Such a like apparition is made with the Sunnes or Moones images, layned unto these circles, set also in good and unifoyme order.

The cause of these is the meeting together of all those seuerall causes that make the circles, Raynbowes, Creames, and images,

ges of the Sunne or Moone, which toynd
all together, make the wonderfull sight of
Kinge Raynbowes, positions of circles,
crosses, and diuers lights, which pertaine
to the knowledge of Optic and C^{ro}p-
tic, that teach how by diuers refractions &
reflections of beames, such visions are
caused. So that he which will know how
they are generated, must retorne into the
seuerall treatises of Raynbowes, circles,
beames, and images of the Sun or Moone;
and if in them he find not knowledge suf-
ficient to instruct him, I must lead him to
the demonstrations of perspective, where
he shall want nothing.

Optice
at
Optice.

Another sort of them, no lesse often
beheld within these few yeeres, than the
former, but a great deale more strange
and wonderfull to looke upon, are the
sights of armies fighting in the Ayre,
of Castles, Cities, and Townes, with
whole Countreies, having in them Hills,
Halls, Rivers, Woods, also Beasts, men,
and fowles, Monsters, of which there are
no such kindes on the earth, and finally,
all manner of things and actions that are
on the earth, as burials, processions,
iudgements, combates, men, women,
children,

childzen, hozses, crownes, armes of certaine noble men, and countries, weapons of all soztes, sometimes starres, Angels as they are painted with the image of Chzt crucified, besteging of castles and towne, many things and gestures done by men or beasts, the very similitude of persons knowne to the beholders, as of late, was seene the very Image of the Emperour Charles, in so much that they which beheld it, put off their cappes, thinking verily it had beene he, and of Iohn Frederick, Prince Elector of Saxony, who that time was prisoner with the Emperour. Also the image of small crosses, which hath beene not only in the ayre, but also on the earth, on mens apparell, on dishes, plates, pots, and all other things, so that the lowes have been full angry, that they could neither wash, nor rub them out of their apparell. In Germany also fires and many such things, as it were long Crozier seen in the ayre.

All these wonderfull apparitions may be caused two manner of wayes: the one artificially, the other naturally. Artificially, by certaine glasses, and instruments made according to a secret part of that know.

knowledge, which is called Catoptrick, Catoptr
ce.
 and so peradventure some of them have
 bene caused, but the most part (doubtlesse)
 naturally, when the disposition of the ayre
 hath bene such, that it hath receyved the
 image of many things placed and done
 on the earth. And because it is apt to re-
 ceive divers images, as well in one place
 as in another, these monstrous formes
 and strange actions, or fables, proceed, of
 the toyning of divers formes and actions,
 as if two Histories were confusedly payn-
 ted in one, the whole picture would bee
 strange: or (as the Poet saith) if a Day-
 ter, to a mans head, would set a horses
 neck, and after, divers feathers. Some-
 times also, one image is multiplied in the
 ayre, into many or infinite, as are letters
 and crosse, which fill all the ayre, even be-
 neath: And the light of the Sun, receyved
 into little parts maketh so appeare, as it
 were many small starres.

Horatius.

Let this suffice, concerning these won-
 derfull apparitions: once againe admo-
 nishing the Reader, though I have in-
 terprised to declare these by naturall rea-
 son, yet verily believing, that not so
 much as one Sparrow falleth to the
 ground,

ground, without Gods pzobidence, I doe
also acknowledge Gods pzobidence bzing
geth these to passe, to such end as befoze I
habe shewed, using these causes, as meanes
and instruments to doe them.

The fourth Booke, of watry impressiōs.

Whose be watry impressiōs,
that consist most of water.
In the treaty of them, are
wont to be handled these
impressiōs, namely
cloudes, rayne, dew, hoare
frost, haille, snowe, springs, rihers, and the
great Sea it selfe.

Of Cloudes.

Clouds.

A Cloud is a vapor cold and moyst,
drawne out of the earth, or waters,
by the heate of the Sunne, into the middle
region of the ayze, where, by cold it is so
knit together that it hangeth, untill either
the waight, or some resolution, cause it to
fall downe.

The place wherein the cloudes doe
hang, is sayd to be in the middle region
of the ayze, because men see it is necessa-
rie that there should be a cold, which
should

should make those vapors so grosse and
thick, which for the most part are drawn
so thinne from the earth, that they are
invisible, as the ayre is. And although
they are knowne oftentimes, as Aristotle
witnesseth, to be in the lowest region of
the ayre, nere to the earth, in so much
that sometimes they fall downe to the
earth with great noyse, to the great feare
of men, and no lesse losse and danger; yet
may it be reasonably thought, that these
clouds were generated in the middle regi-
on of the aire, farre distant from the earth,
which by their heavinesse doe by little
and little sinke downe lower into the low-
est region, and sometimes also fall downe
to the earth.

The common opinion is, that they
goe not higher than nine myle, which,
because it leaneth to no reason, is uncer-
taine.

The height
of the
clouds.

Albertus Magnus, whose reason also is
to be doubted of, affirmeth, that the clouds
doe scarce exceed three miles in height,
when they are highest.

Albertus
Magnus.

And some let not to say, that oftentimes
they ascend not past the halfe of one mile
in height.

Againe,

D. Fulkes booke

Againe, other pretending to finde out the truth, by Geometrical demon Aration make it aboue fifty mile to the place where the generation of clouds is.

How these men take the distance from the earth, it is uncertaine: whether that they assigne the least distance, and meane it from the highest part of the earth, as are hill tops, or from the common playne.

Againe, whether they that assigne the highest distance to be from the lowest valleys of the earth, or from the hill tops.

The reason befoze shewed, moveth me to thinke that the most usuall and common generation, I meane, the condensation or making thicke of these thinne vapors, into clouds, is in the middle region of the ayre. But for the distance of the clouds, when they be generated, I thinke, they be sometime nine mile, sometime three mile, sometime halfe a mile, and sometime lesse than a quarter of a mile from the earth.

ists.

Of Mists.

There be two kindes of mists; the one ascending, the other descending.

That which ascendeth, goeth up out of the water, or the earth, as smoke, but doth not

not commonly, spread ober all other parts: it is seen in rivers and moyst places.

The other mist that goeth down toward the earth, is when any vapor is lifted up into the ayre, by the heat of the Sun, which not being strong enough to draw it so high, that the cold may knit it, suffereth it, after it is a little made thick, to fall down againe; so it filleth all the ayre with the grosse vapours, and is called, *Mists*, being usually a signe of faire weather.

Of empty cloudes.

There be certaine clouds that are empty, and send no rayne; they come of two sorts. One sort are the remnants of a cloud that hath rained, which cannot be converted into water, for their drynesse.

Empty
clouds.

Another sort is of them that are drawne up out of wet and dry places, and be rather Exhalations than vapors: that is, they be dry, hote, and light, so that it were hard for them to be turned into rayne: they looke white, like flocks of wolle, when the light striketh into them.

There be also empty cloudes, which, when the winds have dispersed abroad any cloud, are scattered ober all the skie: but these cloudes, though for a time they be empty, yet because

D. Fulkes booke

because they consist of such a substance as is watry, they may be, and are oftentimes gathered together, and give plentiful rayne,

Of the colours of clouds.

Of the colours of cloudes, we have spoken in the second booke of fiery Meteors, where those colours and the causes of them are described, which seeme to be fiery, or may be thought to be inflammations or burnings, as to be redde, fiery and yellowish.

But besides those, there be white, black, blue, and Greene.

White clouds be thinne, and not very watry, so that the light receiued in them, maketh them to appeare white.

Black clouds be full of thicke, grosse, and earthly matter, that maketh them looke so darke.

Blue clouds be full of thicke drosse, and earthly, as the black: so the light receiued in them, maketh them to seeme blue.

Greene clouds are altogether watry resolued into water, which receiuing into them the light, appeare greene, as water doth in a great vessell, or in the Sea and Rivers.

Of

Of Raine.

After the generation of clouds is well Raine knowne, it shall not be hard to learne, from whence the Raine commeth.

For after the matter of the cloud being drawn up, and by cold made thick (as is said before) heate following, which is most commonly of the Southerne winde, or any other wind of hot temper, doeth resolve it againe into water, and so it falleth in drops, to give increase of fruit to the earth, and move men to give thanks to God.

There be small Showres, of small drops, and there be great Showres, of great drops.

The Showres with small drops, proceed eyther of the small heate that resolveth the clouds: or else of the great distance of the clouds from the earth.

The streames with great drops contrariwise doe come of great heate, resolving or melting the cloud, or else of small distance from the earth. Whereof we see a plaine experiment, when water is powdered forth from an high place, the droppes are small, but if it be not from height, it will either have no droppes, or very great.

D. Fulkes booke

The cause why raine falleth in round drops, is both for that the parts desire the same forme that the whole hath, which is round; and also, that it is best preserved against all contrary qualities: like as we see water powdered upon dry or greasy things to gather it selfe into roundels to avoid the contrariety of heats and drynesse.

Why raine
water is
not salt.

It is not to be omitted, that raine water, although a great part of it be drawn out of the sea, yet most commonly it is sweet and not salt.

The cause is, because it is drawn up in such small vapors, and that salt part is consumed by the heat of the Sunne.

The raine water doubtlesse doth more increase and cherish things growing on the earth, than any other water where so ever they may be watered, because the raine water retaineth much of the Sunnes heat in it, that is no small comfort to all growing plants. The water that cometh from Heaven, in raine, will sooner come to putrefaction, or stinking, than any other, because it hath beene made very subtil by heat, and also for that it is mixed with so many earthly and corruptible substances.

Rayne

Rayne water, that falleth in the summer. Avicenna
 by Avicenns iudgement, is moze wholesome
 than other water, because it is not so cold
 and moyst as other waters be, but hotter
 and lighter.

Sometime there is salt rayne, when Salt rayne
 some Exhalation which is hot and dry, is
 commixed with the vapour whereof the
 rayne consisteth.

Sometime it is bitter, when some Bitter.
rayne.
 burnt earthy moysture is mixed with it.

This rayne is both unwholesome, and
 also unfruitfull. In these countreys, there
 is great store and plenty of rayne, because
 the Sunne is of such temperate heate, that
 it gathereth many vapours, and by im-
 moderate heate doeth not consume them.
 But in the East parts, in some hot Coun-
 treys, it neuer or seldome is seene to rayne,
 as in Egypt and Syria, but in stead of
 rayne, Egypt hath the River Nilus, whose The river
Nilus.
 overflowings doe marvellously fatten
 the earth. In Syria and other like Coun-
 treys, they have moze plentiful dew, than
 we have, which doth likewise make their
 earth exceeding fruitfull.

Seneca testifieth, that the rayne sokeeth no
 deeper in to the earth, than ten fote deepe. Seneca.

D. Fulkes booke

Of the signes of rayne.

signes of
rayne.

First, if the skie be red in the morning, it is a token of rayne, because those vapours which cause the rednesse, will be shortly resolved into rayne.

If a darke cloud be at the sunne rising, in which the sunne sone after is hidde, it will dissolve it, and rayne will follow. If then appeare a cloud, and after, vapours are seene to ascend up to it, that betokeneth rayne.

If the Sunne or Moone looke pale, look for rayne.

If the Sunne in the East seeme greater than commonly he appeareth, it is a signe of many vapours which will bring rayne.

If the Sunne be seene very earely, or few starres appeare in the night, it betokeneth rayne.

The often changing of the winds, allethweth tempest.

The most sure and certayne signe of raine, is the Southern wind, which with his warmenesse, alwayes resolveth the clouds into rayne.

When there is no dew at such times as by nature of the time there should be
raine

rayne followeth : for the matter of the dew is turned into the matter of watry Clouds.

If in the West, about the Sunne setting, there appeare a black cloud, it will rayne that night, because that cloud shall want heate, to disperse it.

When much dust is raysed up, & when the winds make a great noyse, some tempest is towards.

Hard Stones will be moyst, and sweate against rayne : lamps & candles by sparkling, frogs crying, trees breaking, leaves falling, and dust clottering, foreshewes of a tempest.

Fleas, flies & gnats, bite soze toward a tempest, kine feede greedily, birds seeke their vitailles moze busily : for in the grosse ayze disposed to rayne, their stomacks are hotter, and they moze hungry. But these kind of signes pertaine not so properly to Meteorologic, as to Mariners and husbandry, which have a great many moze than these. And Virgill in his first booke of Georgikes, hath a great number, for them that list to learne. Wherefoze let these hitherto suffice.

Of monstrous or prodigious rayne.

Mon-
ous
ne.

Hither to we have made mention only of naturall rayne, & that which is common, which no man doth marvell at. But there is some time such rayne, that woorthily may be wondred at : as when it rayneth wormes, frogges, fishes, blood, milke, flesh, stones, wheat, iron, woad, bzick, and quicksilver. For histories make mention, that at divers times, it hath rayned such things, whose naturall cause, for the most part, we will goe about to expresse, notwithstanding, accounting them among such wonders, as God sendeth to be considered for such ends, as we have before declared, Wormes and Frogges may thus be generated : when fat Exhalations are drawn up into the ayre, by a temperature of hote and moyst, such vermine may be generated in the ayre, as they are on the earth, without copulation of male and female. Or else, that with the Exhalations and vapors, their seed and egges are drawn up, which being in the clouds brought to forme, fall down among the rayne.

Vormes &
frogges.

Fishes.

Milke.

Likewise the spawn of fishes, being drawne up, maketh fishes to rayne out of the clouds. The vehement heate of the Sunne,

Sunne, in Summer, and specially in hote Countries, draweth milke out of the paps of beasts and cattell, which being carryed up in vapours, and resolved againe into milke falleth downe like rayne.

After the same manner, the Sunne also Blood. from places where blood hath beene spilt, draweth up great quantity of blood, and so it raineth blood.

It rayneth flesh, when great quantity of Flesh. blood being drawn up, it is clotted together, and seemeth to be flesh.

Avicen sayth, that a whole calfe fell Avicen. out of the ayze: and some would make it seeme credible, that of vapours and Exhalations, with the power of heavenly bodies concurring, a calfe might be made in the clouds. But I had rather thinke, that this calfe was taken up in some Nozme of whirlewind, and so let fall againe, than agree to so monstrous a generation.

It is a great deale more reasonable, Stones. tha Stones of earthly matter gathered in clouds, should be generated as we have said befoze of the thunderbolt. Yet some men thinke, that wind in caves of the earth breaking upward violently, carrieth befoze it, earth & Stones into y^e ayze, which cannot

ick.

long abide, but fall downe, and are counted among prodigious raine. Exhalations that be earthy and drawn out of clay, haue much grosse substance in them, which gathered together, and by great heat burned in the clouds, make brick, which is no great marvell.

hear.

He that hath seene an eggshell full of dew drawn up by the Sunne into the ayre, in a May morning, will not thinke it incredible, that wheat and other graine should be drawn up in much hotter countries than ours is, much rather the meale by flowre which is lighter.

wooll.

A certaine mossynesse, like wooll, as is upon Quinces, willowes, and other young fruits and trees, is drawn up of the Sunne among the vapours and Exhalations, which being clotted together, falleth downe like locks of wooll.

Quicksilver.

Quicksilver, all men know with small heate will be resolved into most thin vapours, whereof when quantity is drawn up, it falleth downe againe: As it is read, that once at Rome it rayned Quicksilver, wherewith the brassen money being rubbed it looked like silver.

Titus Livius maketh mention, that it rayned

payned chalk, wherof the cause cannot
be hid to them, that read how stone and
which come in the ayre.

Chalke.
T. Livius

Iron hath also rained out of the clouds,
and sundry times, as history witnesseth,
whereof this hath bin the cause: The ge-
nerall matter of all mettalles, which is
quicksilver and bymestone, with the speci-
all matter of mixtion, that maketh Iron,
were all drowne up together, and there
concocted into the metall: so came the
strange time of Iron.

Iron.

Avicen saith, he saw a peece of Iron
that fell out of the clouds, that waighed
about an hundred pound waight, wherof
very good swordes were afterwards made.

Avicen.

Of Dew.

Dew is that vapour, which in Spring
and Autumne, is drowne up by the
Sunne in the day time, which, because it
is not carried into the middle region of
the ayre, abiding in the lower region, by
cold of the night, is condensed into
water, and falleth downe in very small
doppes.

Dew.

There is common dew, and sweet dew.

One

Manna.

One kinde of the sweet dewes is called Manna, being white like Sugar, which is made of thick and clammy vapors, which maketh it so to fall thick and white. It falleth only in the East parts. As for that Manna, which God rained to the Israelites, it was altogether miraculous.

Plinius.

Arabia.

In Arabia (as Plinius writeth) is a very precious kinde of dew, that is called Ladanum, which falling upon the herbe Cusis, & mixed with the iuice of that herbe which Goates doe eat, is gathered of Goates hatres, and kept for a treasure.

Ladanum.

Cusis.

There is another kind of sweet dewes, that falleth in England, called the speldewes, which is as sweet as honey, being of such substance as honey is: it is drawne out of sweet herbes and flowers.

Bitter dew

There is also a bitter kind of dew, that falleth upon herbes, and lyeth on them like branne or meale, namely, because it is of an earthy Exhalation, and so remaineth, when the moisture is drawne away: this dew killeth herbes.

The common dew drunke of cattell, doth rotte them, because the matter is full of viscosity, bringing them to a fluxion.

There be three things that hinder dew from

from falling, that is, great heate, great cold,
and wind: for dew falleth in the most tem-
perate calme time.

Of hoare Frost.

Hoare frost, or white frost is nothing Hoare
frost.
Hesse, but dew congealed by over much
cold. The South and East wind doe cause
dew, but the North and Northern winds
doe scize the vapours; and so it becommeth
hoare frost: which, if that excessive cold
had not bin, should have turned into dew.

The dew and the hoare frost agree in
three things, namely, in matter, in quality
of time, and place of their generation. In
matter they agree; for they are both gene-
rated of a subtil and thinne vapour, and al-
so small in quantity.

In quality of time they consent; for both
are made in a quiet and calme time: for if
there were great wind, it would be away
the matter, and so could there be no gene-
ration.

Thirdly, they are both generated in the Aristotle
lowest region of the ayre, for (as Aristotle
affirmeth) upon high hilles, there is neyther
dew nor hoare frost.

They differ also in three things. For
the

the hoare frost is congealed, before it is turned into water; so is not the dew.

Secondly, the dew is generated in temperate weather, the white frost in cold weather.

Last of all, hote windes, as the South and East, doe cause dew, but cold windes as the North and West, doe cause hoare frost.

Hoare frost doth often stinke, because of the stinking matter whereof it consisteth, which is drawne out of lakes and other muddy and stinking places.

Of Hayle.

Hayle.

HAyle is a hote vapour in the middle region of the ayre, by the cold of the region, made thick into a clond, which falling downe to the sudden cold of the lower region, is congealed into Ice.

There be so many kindes of hayle, as there be of rayne. The fashion of hayle is sometime round, which is a token, that it was generated in the middle region of the ayre, or very nere it: for falling from high, the corners are worne away.

When the hayle-stones are square, or three-cornered, the hayle was generated nere the earth.

Often.

Oftentimes there is heard a great
 sound in the Clouds, as it were of thunder,
 tempeste haile, or of an army fighting, &c.
 The cause is, that vapours of contrary
 qualities, being inclosed in the Cloud, doe
 strive to breake out, and make a noyse, e-
 ven as cold water doeth, being put into a
 lething pot.

In spring and bar best time is often haile,
 seldome in Summer and Winter. In win-
 ter there want hote vapours; in Summer,
 the lowest region is too hote, to congeale
 the rayne falling downe. In spring and
 Autumne, there want neyther hote va-
 pours, to resist the cold, nor sufficient cold
 to harden the drops of that hote thowze of
 rayne.

The haile stones are sometimes grea-
 ter, and sometimes lesser; greater, with
 greater cold, and lesser, with lesser cold.

There is seldome haile in the night, for
 want of hote vapours to be drawn up.

Sometime haile and rayne fall together,
 when the latter end of the Cloud, for want
 of cold in the lowest region, is not con-
 gealed.

Haile stones are not so cleare, as Ice,
 because they are made of grosse and earthy
 vapours,

vapours, Ice is congealed of cleare water.
 Hayle is swifter resolbed into water
 than Snow, because it is of a moze sudden
 and swift generation.

Of Snow.

now.

Snow is a cloud congealed by great cold
 before it be perfectly resolbed from va-
 pours into water.

Snow is white, not of the proper colour,
 but by receiuing the light into it, in so ma-
 ny small parts, as in some, or the white
 of an egge beaten.

Snow is often upon high hills, and ly-
 eth long there, because their tops are cold,
 as they be neere to the middle region of the
 ayre: for oftentimes it rayneth in the val-
 ley, when it snoweth on the Hills.

original
 Christ.

Snow melting on the high hills, and af-
 ter frozen againe, becommeth so hard, that
 it is a stone, and is called Christall.

Other matters of Snow, because they
 are common with Rayne, are needlesse to
 be spoken of. To be short, dew is generated
 even as Snow, but of lesse cold, or else be-
 ginneth to melt in the falling.

Snow causeth things growing to bee
 fruitfull, and encrease, because the cold
 dybeth

hath beate unto the rotes, and so cheri-
sheth the plants.

Of Springs and Rivers,

The generation of springs is in the
bowels of the earth, therefore some-
thing must be said of the body of the earth.
The earth, though it be solid and massie,
yet hath it many hollow gutters & veines,
in which is alwayes ayze to abyde empty-
nesse: for the ignorant in Philosophy must
be admonished, that all things are full, no-
thing is empty, for nature abhorreth emp-
tinesse, so that where nothing else is, there
is ayze and vapours, which by cold, as it
hath often been said, will be resolved into
drops, as we see experience in marble pil-
lers & such like hard stones, toward raine.
This ayze & vapours therefore, being tur-
ned into drops of water, these drops sweat
out of the earth, and finde some issue at the
length, where many being gathered toge-
ther, make great abundance of water,
which is called a fountaine or spring. The
cause why such springs doe run continual-
ly, is because that ayze can never want in
these veines, which by cold will alwayes be
turned

Springs.

Nothing
empty.

turned into water, so that as fast as the water runneth forth, so fast is it againe received into the place, whereby it commeth to passe, that so many springs are perpetual, and neuer dried: but if any be dried up, it is in a hot Summer, and such springs also they be, whose generation is not deep in the earth, and therefore the vapors may be made dry, and the earth warme, so the spring may faile.

There be foure kinds of springs, Fontaines, brookes, rivers, and lakes.

Of Fontaines.

fontaines.

Fontaines bee small springs, which serue for wells and conduits, when there is but one place, where the water is generated, and that is not very abundant, either because it is of small compasse, or small veines, and not many.

Of Brookes.

brookes.

Brookes, boyes or fordes, bee small streames of water, that run in a channell, like a river. They are caused when either the spring occupieth a great compasse, or else two or thre small springs meet together in one channell.

Of Rivers.

ivers.

Rivers are caused by the meeting together,

gether, not only of many springs, but also of many brookes and fozds, which being receiued in diuers places as they passe, are at the length caried into the broad Sea for the most part. Howbeit some Rivers as swallowed up into the Earth, which perchance run into the Sea, by some secret and unknowne channels: some Rivers there be, that hide their heads under the Earth, and in another place, far off, breake out againe. They write also, that some Rivers being swallowed up of the Earth, in one Island doe run under the bottome of the earth and Sea, and breake forth in another Island. There be also many great Rivers, that run under the Earth in great Caves, which never breake forth. Aristotle sheweth of ponds and lakes, that be under the Earth. And Seneca speaketh of a pond, that was found by such as digged in the Earth, with fishes in it, and they that did eat of them, dyed. As Bees that be found in darke places, as Wells that haue bene dammed up, &c. are poyson.

Aristot.

Seneca.

Of Lakes.

Lakes.

Lakes are made by the meeting together of many Rivers, brookes and springs into one deepe valley: whereof, some are so great,

¶

great,

great, that they have the name of seas, as the great lake called Hircane, or Caspian Sea. These lakes sometimes unlade themselves into the Sea, by small rivers, sometimes by passages under the earth.

The cause of the swiftnesse of Rivers, is double: for they are swift, either for the great abundance of waters, or else because they run downe from an hilly place, as the River Rhene fallth down from the top of wonderfull high hills.

Of hot Bathes.

note
baths.

Some waters, that are generated & flow out of veins of brimstone, are sensibly warme, and some very hot, because they run out of hot places. These waters being also drying by nature, are wholesome for many infirmities, specially breaking forth of scabs, &c. Such are the baths in the West country, and S. Anne of Buck- stones well in the North part of England, and many other elsewhere.

Of the divers tastes that are perceived in welles.

tastes of
waters.

For a generall reason, the waters receive their taste of that kind of earth, thozome which

which they runne, as thozow a strayer.
Some salt, that run thozow salt beines of
the earth: some sweet, that be well stray-
ned, or run thozow such minerals as be of
sweet taste: some bitter, that flow out of
such earth, as is bitter by adustion or o-
therwise.

Some lowze or sharpe, like vineger,
which run thozow beines of Allome, co-
perus, or such minerals. Aristotle writteth
of a well in Sicilia, whose water the Inha-
bitants used for vineger.

Aristot
Well w
terusee
Vinege
Bohem.

In Bohemia neere to the city called Bi-
len, is a well that the people use to drinke of
in the morning, in stead of burnt wine.

And in diuers places of Germany be
springs, that taste of such sharpenesse.

Some haue the taste of wine, as in
Paphlagonia is a well, that maketh men
drunke, which drinke thereof: which is, be-
cause that water receiveth the fumosity of
brimstone, and other minerals, thozow
which it runneth, and so filleth the braine as
wine doth.

Paphla-
gonia.

A recitall of such rivers and springs, as have
marveilous effects, whereof no naturall
cause can bee assigned by most men, al-
though some reason in a few may be found.

arveylus
aters
litumnus
opert.

oetia.
clas.

eneca.

ibia.

eneca.

Clitumnus, which maketh Dren that
dzink of it, white, is a Riber oz spring
in Italy, Propert. lib. 3. This may be the
quality of the water, very flagmatick. In
Boetia is a riber called Melas, that maketh
sheep black, if they dzinke thereof.

Seneca speaketh of a Riber that maketh
red hayres. These two with the first, may
have some reason, that the quality of the
water may alter complexion, and so the
colour of haire may be changed, as we see
in certaine diseases.

In Libia is a spring, that at the Sunne
rising and setting, is warme; at mid day
cold, and at mid night, very hote. This
may be, by the same reason, that wel wa-
ter is colder in Summer, than it is in
winter. Seneca writeth, that there bee
Ribers, whose waters are popson: this
may be naturally, the water running thro-
w low popsonous minerals, taking much
fume of them. Other Wells that make wood
and all things else that be cast into them,
stones, such welles be in England, the cause
is great cold.

Another Well maketh men madde that
dzinke thereof. This also may have as
good reason, as that which maketh men
dzunke:

drunke: As also that Well, which maketh men forgetfull by obstruction of the brain.

The same Seneca speaketh of a Water, that being drunke, proboketh unto lust and lechery. And why may not that quality be in a Water, which is mixed with diuers minerals and kinds of earth, which is in herbes, rootes, fruits and liquours?

S. Augustine speaketh of a well in Egypt, in which burning torches are quenched, & being before quenched, are lighted. S. August.

Among the Garamants is a Well, so cold in the day, that no man can abide to drinke of it: in the night so hot, that none can abide to feele it. Garamants.

It is incredible, that is writtten of a well in Sicilia, whereof if thesbes did drinke, they were made blind. Sicilia.

In Idumea was a Well, that one quarter of a yeere was troubled and muddy, the next quarter bloudy, the third greene, and the fourth, cleare. Idumea.

Seneca writteth of another Well, that was sixe houres full and running over, and sixe houres decreasing and empty: per chance, because it ebbed and flowed with the Sea, or some great River that was nere it.

racius

In the hill Anthracius, is sayd to be a well, which when it is full, signifieth a fruitfull yere, when it is scarce and empty, a barren and deare yere. The sufficiency of moisture maketh fertility, as the want causeth the contrary.

garia.

Pen say, there is a river in Hungary, in which Iron is turned into Copper: which may well be, seeing inke, in which is but small coperus, and artificially mixed, of Iron, doth counterfeit copper in colour. In this streame may be much coperus, and that is naturally mixed.

eca.

rophra-
s.

Both Seneca and Theophrastus witness, that waters there be, which within a certaine space, being drunke of sheepe, (as Seneca sayth) or of birds (as Theophrastus will have it) changeth their colours from black to white, and from white to black.

truvius.

cadia.

onacri-

Vitruvius writeth, that in Arcadia is a water called Nonacrinis, which no vessel of Silber, Brasse, or Iron, can hold, but it breaketh in peeces, and nothing, but a Spules hose, will hold it and containe it.

ylria-

In Illyria, garments that are holden over a most cold Well, are kindled and set

set on fire.

In the Ile of Andros, where the Tem- Andros
ple of Bacchus stood, is a Well, that the Bacchu
first day of January flowed wine.

Isidore saith, there is a Well in Italy that Isidorus
healeth the wounds of the eyes.

In the Ile of Chios is a Well, that ma- Chios.
keth men dull-witted, that drinke thereof.

There is another, that causeth men to
abhorre lust.

Lechnus, a Spring of Arcadia, is good Lechnus
against abortions.

In Sicilia are two Springs, of which one Sicilia.
maketh a woman fruitful, and the other
barren.

In Sardinia be hote Welles, that heale Sardinia
soze eyes.

In an Ile of Pontus, the River As- Pontus
res overfloweth the fields, in which what Astares.
soeuer sheepe be fedde, doe alwayes giue
black milke.

In Aethiopia is a Lake, whose water is Aethiop
like oyle.

Also, many Springs of oyle have bro-
ken forth of the earth, which cometh of
the viscosity or fatnesse of the same earth.

The Lake Clitory, in Italy, maketh men Clitori
that drinke of it, to abhorre wine.

atassium
inus.

The lake Pentasium (as Solinus sayth)
is deadly to Serpents, & wholsom to Men.

ia.

Seneca writeth of certaine Lakes that
will beare men, which cannot swimme.
And that in Syria is a lake, in which bricks
doe swimme, and no heaby thing will sinke.

cnus.

It is said, that the River Rhene in Ger-
many will drowne bastard childzen that be
cast in it, but dibe aland them that be
lawfully begotten.

panis.
hia.

The River Hypanis in Sythia, ebery day
bryngs forth little bladders, out of which
flies doe come that dye that same night.

trona.

Matrona the River of Germany, as the
common people saith, never passeth day,
but he taketh some pray.

Of the Sea.

e Sea.

The Sea, in this treatise hath place as
a mixed substance: for else the ele-
ment of waters being simple, were not
here to be spoken of.

e natu-
place
the wa-

The Sea is the naturall place of the wa-
ters, into which, all Rivers and other wa-
ters are receiued at the length.

And here it is to be understood, that the
very proper and naturall place of the wa-
ter,

ter were to cover all the earth, soz so be the elements placed : the earth lowest , and round about the earth the water, about the water, the ayre, and about the ayre, the fire.

But God the most mighty and wise creator of all things. that the earth might in some parts be inhabited of men and beasts commanded the waters to be gathered into one place , that the dry land might appeare, and called the dry land, earth, and the gathering of waters, he called Seas.

Gen. 1.

In the Sea, are these two things to be considered, the saltnesse, and the ebbing and flowing.

Of the saltnesse of the Sea.

The saltnesse of the Sea, according to Aristotles mind, is caused by the Sun, that draweth from it, all thin and sweet vapours, to make raine, leaving the rest, as the setting oz bottome, which is salt.

Aristotle.

But men of our time, peradventure more truely, doe not take this for the only and sufficient cause, to make so great a quantity of water salt, but say, that the Sea, by Gods wisdom is gathered into such valleyes of the earth, as were otherwise barren and unfruitfull ; such earths are

D.Fulkes booke

are salt, the sea water then mixed with that earth, must needs be salt, else Rivers by Aristotles mind, should be salt, as well as the Sea. The Reader may choose which opinion is most probable.

Of the ebbing and flowing.

ebbing &
flowing.
Aristotle.

The ebbing and flowing of the Sea, as Aristotle seemeth to teach, is by reason of Exhalations that bee under the water, which drive it to and fro, according to contrary bounds and limits, as upward and downeward, wide and narrow, deepe and shallow. This opinion of Aristotle also, is more subtil than true: experience teacheth men to mislike, and to ascribe the cause of ebbing & flowing, to the course of the Moone, which ruleth over moisture as the Sunne doth over heat: for from the new Moone, to the full, all humors do increase and from the full to the new Moone, decrease againe. Also, the very true time of the ebbing and flowing, may be known by the course of the Moone, with whom, as the Lady of moisture, we will close up the fourth booke of moist and watry impressions.

The

The fift Booke, of earthly Meteors, or bodies perfittly mixed.



This last Treatise containeth such bodies, whose chiefe matter is the earth, and are called perfittly mixed, because they are not easily resolued into the chiefe matter whereof they are generated. These are diuided into foure kindes. The first be diuers sorts of earth: the second be liquors concreat: the third be metals and metallikes: the fourth be stones. This diuision is not altogether perfect, both for that there bee many of these minerals, which partake of two kinds, and also for that the names of some of these kinds may be said of other. Yet minding as playnly as can be, to declare the things themselves, the controuersy and cabillation of names, shall not greatly trouble us, especially seeing we pretend not to teach Philosophers, but such as need a ruder & plainer instruction. They may therefore be content with this diuision, which shall not serue them to dispute of these matters, but to understand y^e truth

truth of these things that they desire. Of these four therefore, we will speake orderly and generally, not winding to intreat of every particular kinde (for that were infinite) but to open such universall causes, as they which have wit, may learne, (if they list) to apply unto all particulars.

Of Earths.

Earth.

The earth is an element, one of the four, cold and dry, most grosse and solide, most heaby and waighty, the lowest of all other in place. When I say an element, I meane a simple body uncompounded. This earth is no Meteor, but as it was shewed in the water, to the end there should be generation of things. There is no element that wee can have, which is pure and simple, but all are mixed and compounde. Our fire is grosse and compound; so is our ayre, our water, and our earth: but the earth, notably and aboue the rest, is mixed. For the pure and naturall earth is dry and cold: but we see much to be moyst, and much to be hote. The naturall earth is black of colour: but we see many earths white, many yellow, and many redde. So that first, the greatest part

part of the earth is mixed with water, that maketh it to cleave together, with ayze and some fire, which make an oyle, fat, or clammy earth, as is clay made, &c.

Another great part is dried, not into the naturall drynesse of the first quality, but as a thing once mixed, and after dried, either by too cold, as sand, grabell, &c. or else by heat, as chalk, oker, &c. And yet somewhat moze plainly and particularly to discourse upon these causes, admitting the naturall colour of the earth to be black, of the water to be blue, of the ayze to be white, and of the fire to be ruddy, it followeth, that upon the mixture of these colours, or chiefe domination of them, all things have their colour.

The grosse substance of the earth therefore, being diversly mixed with other elements, and those mixtures againe being easies altered, by divers, & sometime contrary qualities, hath brought forth so many kindes of earth, as clay, marle, chalke, sand, grabell, &c. Clay is mixed with fat moisture, taking his colour of the mixture with red from white, but being cold, it is not so fruitfull as marle, which is not alwaies so moist as it. Chalke is an
earth

D. Fulkes booke

earth by heate concocted, after diuers mix-
tions, and dyed up. Oker, both yelloe and
red, with such like, are of the same nature,
with mixtion of red, moze or lesse.

Sand and grabell, are dyed earths,
as it were frozen by cold: grabell is grosse
and apparent; sand, though it be finer, is
of the same generation, consisting of ma-
ny small bodiees, which are congealed into
stones. Sand seemeth to be clay, dyed by
cold, and comted together into small stones,
whereof some are thozow-shining, which
were the moist parts; the thicke were of
the grosse part: the same is grabell, but of
greater stones consisting. The like iudge-
ment is to bee giben of all other kinds of
earth, whose generation, by the similitude
of these, will not be very hard to finde out.
They that list to know the diuers kinds
of earths, must haue recourse to Plinius,
Cardane, and other writers, that recite a
great number of them: but these are the
chiefe and most common kinds.

linius.
Cardanus.

Of liquors concreate.

WE take not liquors concreat so large-
ly, as the word doth signifie: for then
should we comprehend both the other kinds
follow-

following. But only those liquors, called in Latine, Succi, which are, as it were middle betwene metals and stones, of which, some being fat and oily, doe burne as Brimstone, Sea-coales, Yeat, Bitumen, &c. and the kinds of all these. Othersom doe not burne, as Salt, Allum, Coperus, Saltpeter, &c. and the kinds of these.

Of the first sort, which are generated of earthy and azy vapours, fumes and Exhalations, the chiefe and most notable, is Brimstone, which seemeth to be the matter of all dry and hot qualities, that are in earthly Meteors. The rest are generated of such like vapours as Brimstone is, but then they be diversly mixed: as the coles have much earth mixed with Brimstone: Yeat seemeth to be all one but better concocted than coles. Of Amber is great contenti-
on, whether it be a minerall, or the sperme of a Whale: for it is found in the Sea, cast upon the shore. Now the Whales seed being of the very same qualities is taken moze & lesse concreate of divers hardnes; some almost as hard as Amber: some softer, and some liquid: yet Cardan plainly defineth, that Amber is a mineral. Whether he have reason or experience, contrary to the vulgar opinion,

Cardan

opinion, let them consider that list to contend. These minerals that will resolve with fire, it is apparant, that they were concreate with cold: in that they burnt, it is manifest, they have a fat and clammy substance mixed with them, as the other kinde hath not, which will not resolve so well with fire, as with water; which be salt, coperus, saltpeeters, &c. These burne not, being watry, earthy, and not fat, unctuous nor clammy.

These be of divers colours, black, as Coles, and Feat, because there is much earthy substance mixed with their sulphurous matter. Some be white, as Salt, and Allome, having a substance watry, dyed, and concreate. Coperus is greene because it hath much cold matter that is blue, mixed with it. Salt, the most common and necessary of all these liquors concreat, that be moist and not fatty, hath two manner of generations, one naturall, and the other artificiall. The naturall generation, is, when it is first generated in the earth, after commeth the water of the Sea, and is infected with it; out of which the Salt is againe artificially gathered. Of these liquors concreat, bee those

those strange wells and springs infected of which was spoken in the latter end of the fourth booke. Most notably bzimstone causeth the hote bathes, and burneth in Aetna of Sicilia, and Vesuvius of Italy, casting up the Pumise Stones, of which is no place here to entreat.

Aetna
vesuvi

Of Metals.

Metals be substances perfectly mixed that will melt with heate and be brought into all manner of fashions that a man will. Of these the Alchemists say, there be seven kinds, to answer to the seven Planets: Gold, Silber, Copper, Tyne, Lead, Iron, and Quicksilver that they call Mercury. But saving their authorities Quicksilver is no more a metall, than Bzimstone, which is as necessary to the generation of metall, as quicksilver is. For they all agree, that all metalles are generated of Sulphur, that is, Bzimstone: which because it is hote, they call, The father; and Mercury, that is, quicksilver, which because it is moyst, they call, The mother. So by as good reason, may they call Bzimstone a metall, as Mercury. Then there remaineth

Metal

Mercur

D. Fulkes booke

meth but six perfit metals, Gold, Silver,
Copper, Tynne, Lead, and Iron.

Of Gold.

old,

Why Gold
sæth
ot.

he opini-
of the
cumists.

That most unprofitable and hurtfull of
all metals, Gold which most men dis-
praise, and yet all men would have, is of all
other metals the rarest, it is onely perfit,
all other be corruptible. Gold never cor-
rupteth by rust, because it is pure from
poisonous infection, and most solide, that
it receiveth not the ayze into it, which cau-
seth all things to corrupt. It is perfectly
concocted with sufficient heat, and mixture
of Sulphur: all other metals, either are not
so well concocted, or else they have not the
due quantity of bymstone. This opinion
hath also place among the Alchemists, that
because nature in all her works sæketh
the best end, she intendeth of all metals to
make Gold: but being let, either for want
of good mixture, or good concoction, she
bringeth forth other metals, indeed not so
precious, but much more profitable: and the
lesse precious, the more profitable: for there
is more use to the necessity of mans life,
in iron and lead, than is in gold and silver.
But either the beauty, or the perfection, or
at

at least wise the rarenesse of gold and silver
have obtained the estimation of all men,
so that for them is sold all manner of things
holy and prophane, bodily and spirituall.
What paines doe not men take to winne
gold : every man hath one way or other to
hunt after it : But the Alchemist despising
all other wayes, as slow, unnaturall, and
unprofitable, laboureth, either to helpe na-
ture in her worke, as of imperfect metals
to make perfect, or else to force nature to his
purpose, by his quintessences and elixors, so
that what by purging, what by concocting;
what by mixing of Sulphur & quicksilver &
much other like stuffe, at length he turneth
the wrong side of his gowne outward all the
teeth out of his head, and his body from
health to a palsey, and then he is a Philo-
sopher, and so he will be called.

Of Silver.

Silver, the most pure metall next unto
gold hath indifferent good concoction in
the earth, but it wanteth sufficient heat in
the mixture, that maketh it pale. It is
found (as they say) running into divers
veines, as all other metals be, but this
most specially, after the shape and fashion

Silver

D. Fulkes booke

of a tree, lying along with a body of stock, of proportion like to the body of a Tree, also with armes, branches, leaves and fruites. This metall, Silber, lacketh sufficient heate, and therefore cometh neither to the colour, soliditie, nor perfection of Gold, and is generated in cold countries, nere unto the North and South poles, in so great quantity, that the husbandmen, when they plow their ground, turne up Silber, among the clots in their daily labours, which they doe hide and conceale, lest the greedy Princes, for covetousnesse of the metall, should overturne and destroy their land.

The Gold mines are contrariwise most found in the hot countries of India and Aethiopia, because in them is sufficient of heat, for that unhappy generation.

This Silber also, the Alchemists would faine make by Arte: but Mercurie the chiefe Matter of the worke, is so subtil and so flye, that nothing can holde him, nothing can kill him: for if the glasse bee not very thick, hee will soon breake out of prison, and so there is nothing left.

Of Copper.

Copper, in colour, comming nearest to Gold, being not solid nor massie, (for of all metall, gold is the heaviest) giveth way to corruption, being infected with that greene minerall Copperus. Hereof be divers kindes, brasse, latine, and such like, which differ in digestion: the Copper being purest, is of best digestion, and nearest unto Gold; and so the rest in like degrees.

Copper is most like to silver in the waight, and in the hammering, wherefore the Alchemists have learned to make it white, that it deceiveth mens sight & handling: but the Goldsmiths doe easily try it, and by the taste of counterfeit silver, make copper again. Copper or brasse doth alway grow nere to the mine of Copperus, which running with it in the digestion, or naturall concoction, hindzeth it of perfection, maketh it to stink, and to be eaten of a green rust. much adoe the Alchemists have to turne it into gold, if it might be, they dispute very reasonably and conclude almost necessarily in their talke, that it may be converted into gold, as a body that wanteth little of perfection,

perfection, which may be easily added unto it. But in conclusion of the worke, it is an harder matter to bring it to passe, than it was to purpose, befoze they had done it, to build an Abby at every miles end, upon Salisbury plaine, as one was minded.

Of Tinne.

anne.

Tinne, whereof great plenty groweth in the West parts of England, in beauty and colour commeth nearest to Silber, and of Silber wanteth nothing but solidity and hardnes: so Tinne is raw & undigested metall, also very porous & uncompact, which causeth it to crash, when it is broken or bitten: so it sayleth of heate in the commixtion, and also sufficient digestion in the earth: otherwise it is a faire and profitable metall, to serue the use of them unto whom Silber & gold are not so plentiful.

Of Lead.

ead.

Lead also, found in great abundance within this Realme, is a raw and undigested metall, as Tinne is, but yet of better digestion than commixtion: so it is mixed with a grosse earthy substance, which maketh it to bee in colour so black and so slowe to corrupt: so that of the same fumes
and

and Exhalations, (which if they had been pure and well digested, if the place and matter would have suffered, should have been concreat into Silber) for lack of the same, Lead is generated, which comming plentifully, doth better service than Silber.

Of Iron.

Iron, the most necessary and profitable Iron.
of all other metals, (and yet as ill used of many, as any other, is generated of such substance as Silber is, but mixed with a red minerall, which eateth it with red rust, and also being of too extreame digestion, passing all other metals in hardness. And as other metals, to the perfection of Silber, want sufficient concoction, whereby they come not to the same hardnesse: so Iron passeth and exceedeth Silber in immoderate digestion. But though it come not to the perfection of Silber, God forbid, that all Iron had bene turned into Silber; for then we should more have missed it, than Silber or gold, the want of which would hinder us nothing at all.

Of Quicksilver.

Though Quicksilver be no mettall, yet Quick
silver.
because it is the mother of all metals, something is here to be spoken of it.

There be diuers and sundry opinions, both of the generation, and also the qualities of it, which make the generation to bee hard to finde out. For if the quality were certainly agreed upon, there were an easier way found, to try out the generation. Some affirme, that it is exceeding hote, and that they would proue by the swift pearcing thereof into other things that bee porous.

Other say, it is exceeding cold, and that they proue by the exceeding weight of it, As for the pearcing, they say, it is caused of the exceeding moistnesse, of which quality both parts doe graunt that it is. Concerning the generation, some have said, that it is pure and elementall water: some againe have thought, that it droppeth out of Heauen, and is a part of the Heauenly substance. And other said, that it is generated in the clouds, and falleth downe in the field, in a circle, on those round circles, which are seen in many fields, that ignorant people affirme to be the rings of the Fairies dances. It is certayne, that quicksilver hath diuers times fallen out of the clouds, as we have declared in the treatise of wonderfull and marvellous raine: but

but whether it so fall in circles it is doubt-
full. The most probable opinion is, that
it is generated of moist vapours of the
earth, coated by cold, much like to water,
as Hyminstone is of hote fumes, coated by
cold, much like to fire. And thus much of
metals.

Of Stones.

Stones, the fourth kinde of earthly mix- Stones.
sed bodies, have two manner of genera-
tions, by most contrary qualities: for
heat doth harden moist bodies into Stones,
as we see, that of clay, it maketh exceeding
hard byick.

Altho the thunderbolts in the clouds, are
generated by heat; as befoze hath beene
shewed. But cold doth by congealing, ge-
nerate many moze Stones than heat doth,
for the most part of all the Stones that are
diggd out of the earth, are generated by
cold, which is able to convert any other
kind of mixed substance into Stone, as hath
beene partly shewed in the nature of wells
and springs, of which, there be some in
England, which by their colde, turne
wood, or any like thing into Stones. I
have

habe seen a peece of rotten wood, which
to sight was very light, and like wood, but
in handling, a very stone that was taken
out of such a well. Also of other things ta-
ken out of the earth, turned into stones, I
habe seen and found my selfe, flies, with
head and wings very hard stones, also, I
habe seen a heart, a birds tongue, a beasts
stone, a peare, a plumme; and divers other
things turned into hard stones.

Of the divers kinds of stones.

Stones may first be divided into rude
and beautifull: the rude contayne those
great Rocks, which are generated by ma-
ny small parts ioyned together, and the
common pibble stones, that be found eve-
ry where in the earth, among gravell, and
on the shoze of the Sea, or banks of the Ri-
vers. These are generated of grosse and
earthly humours, congealed by cold, and
because they be neyther faire of colour,
nor thozow shining, and also common, they
are contemptible. The faire or beautifull
stones, be either great or small. The great
be, as marble of divers kinds and colours,
alabaster, and such like, which being hard
and well concocted, may be polished and
become

ockes.

ibble
ones.

arble.

become beautifull. Their colour is as
they are mixed being uncongealed, so is
their purenesse. The small are moze pre-
cious, and they be either thick or pellucide.
The thick be neither so faire nor so preci-
ous, as the Achates, the Jasper, Prassios,
ec. These consisting of a pure matter, and
not very watry, are congealed into such
stones. The cleare stones be liquors con-
create, as the Diamond, the Saphir, the E-
merald, ec. they are praised for their great-
nesse, hardnesse, clearnesse, and faire colours,
of which enough hath bin spoken, saving
that some be of opinion, that these be gene-
rated by heat, because the best are found in
hot countries, in the East, and in the South.
Answer may be made, that the hotter the
ayre is, the colder is the earth: so that rea-
son is of small force.

Achates
Jasper.
Prassios

Diamond
Saphir.
Emerald
The pre
of precl
Stones.

Of the vertue of stones.

Some perchance, would looke that we
should make a long discourse of the ver-
tue of stones, and would be well content that
we should entreat of diuers properties of
gemmes and precious stones, which matter
though it be out of our purpose (which con-
sidereth only the generation) yet seeing it
is

The ve
tue of
Stones.

is not out of their expectation, some thing
briely; and yet sufficiently shall be said of
the vertue of stones.

the vertue
of stones
either na-
turall or
magickall.
lagnes.

That vertue that is ascribed unto them,
is either naturall, or magickall. Naturall
vertue, is either that which is known to
have a naturall cause, or a naturall effect,
as the Magnes or Load-stone, to draw
Iron, which is by a similitude of nature,
and such an appetite, as is between the
male and the female. Also, the said Mag-
nes moveth toward the North, and as some
say there is another kinde, found in the
South, that draweth toward the South.
They say, that there are great hills of this
stone in the North and South, which ma-
keth it looke that way.

Other being a Mathematicall reason,
which because it is more curious, than can
be understood of the common sort, not ex-
ercised in Geometry, I omit.

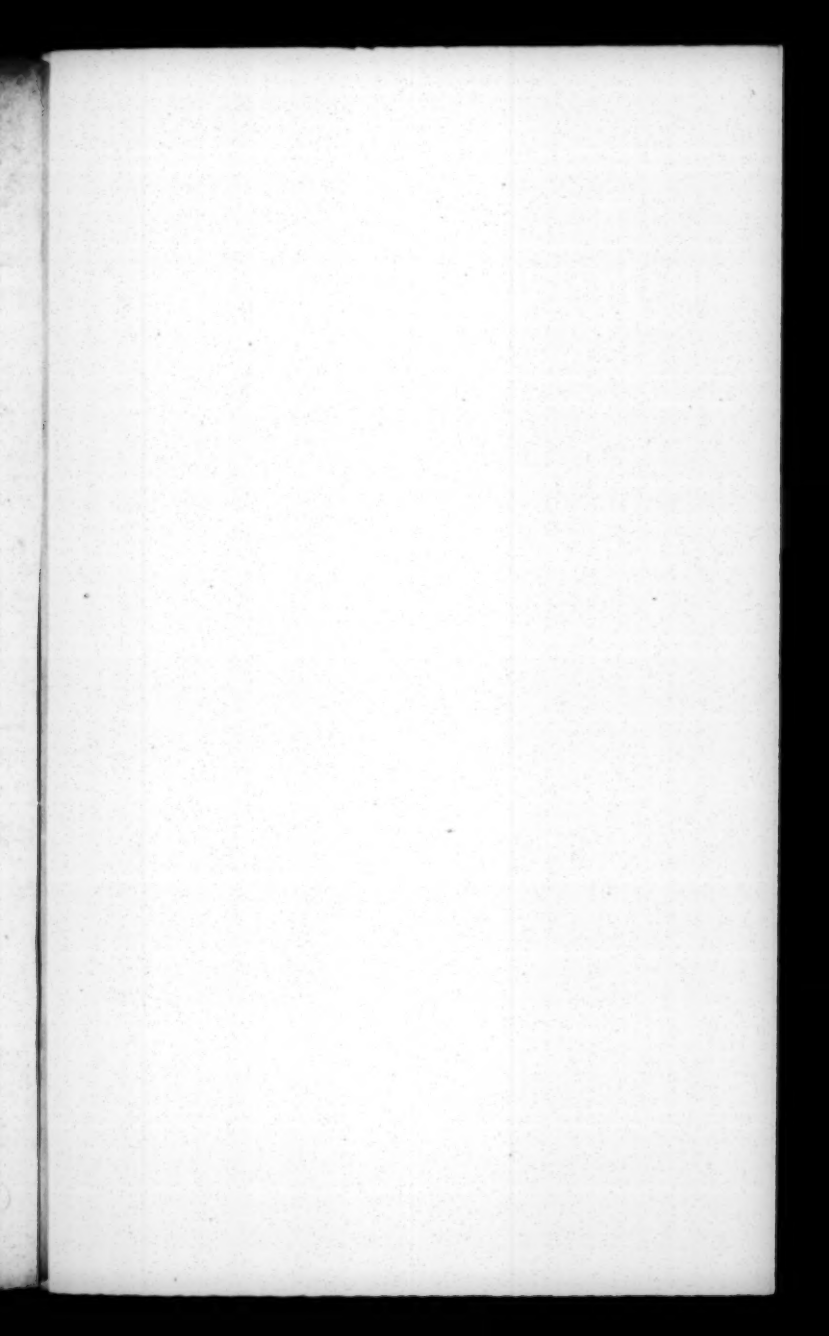
The Heat and Amber draw hayres,
chaffe, and like light matter, but being be-
fore chased; for heat is attractive.

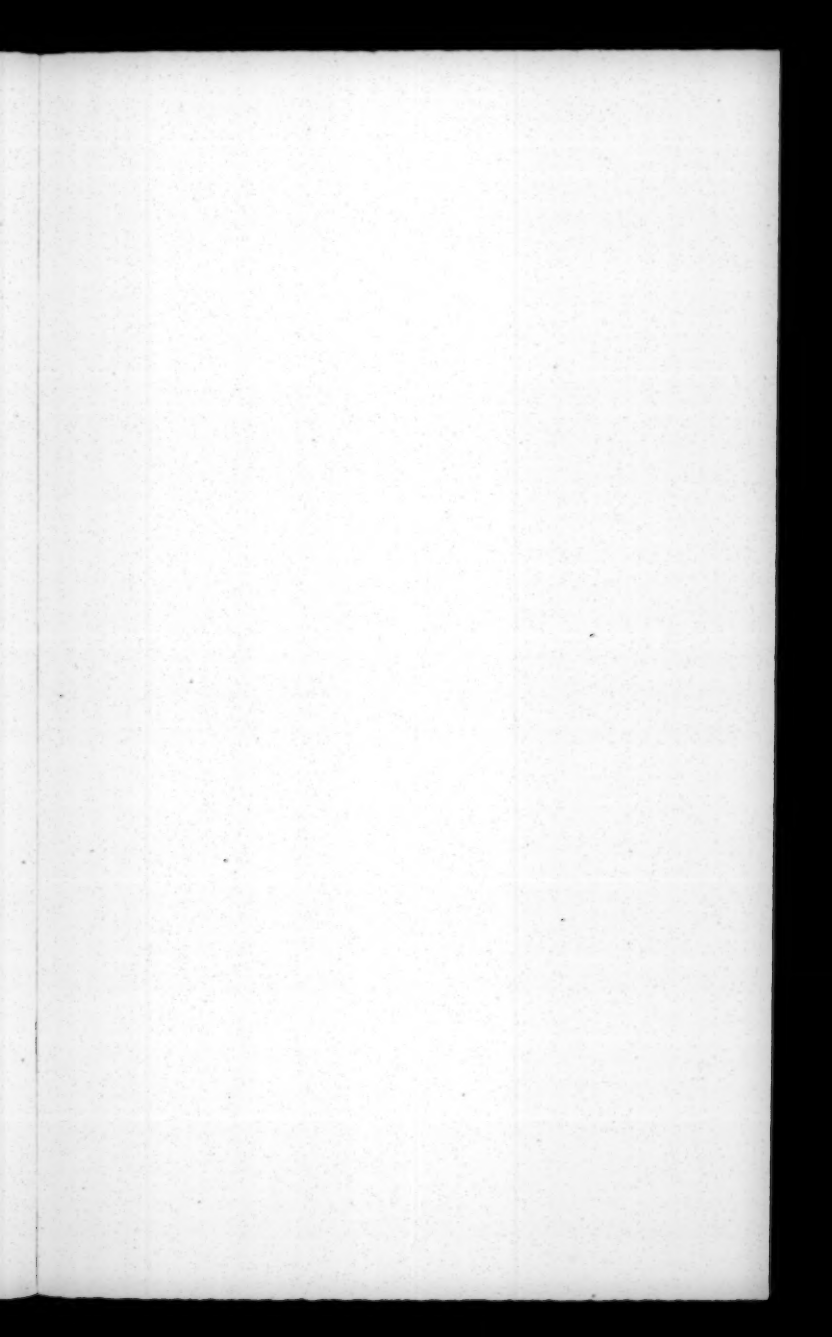
Also the precious stone called Astroites,
moveth it selfe in vinegar, the sharp-
nesse of the vinegar pearcing it, and the
ayze excluded, driving it forward. These
vertues

vertues because I have sene, I have set
 for an example: generally all other like na-
 turall vertues, procede of like naturall
 causes, which by their effect, the ingenious
 must seeke to finde out. As for magicall
 vertues, be they, which are grounded of no
 reason, or naturall cause, which if they
 take effect, it is rather of the superstition &
 credulity of him that useth them, than of
 the vertue of the stones. As that an Eme-
 rald increaseth love, a Saphir favour, a
 Diamond strength, and such like vertues, Albertus
 of which Albertus in his age, surnamed the Magnus-
 great, tooke paines to write a booke, which
 I suppose to be englished. To conclude with
 the cause why stones melt not, as metals
 doe, may be gathered, by that which hath
 bin said before, because they are congea-
 led past that degree, and also because there
 is left in them, no viscous, or clam-
 my matter. Let this suffice for
 stones: and so the whole
 purpose is at an
 end.

FINIS.

D. Fulk.







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